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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

September 2003

Data Assimilation
Meteorological Office
London Rd
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Berkshire
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CG2556	P	26	0	0	0.6	-9.9	10.0
C6CU6	P	35	0	86	2.9	6.8	7.4
DICB	P	31	0	23	1.3	4.0	4.2
ELQQ4	P	36	0	75	2.1	-4.2	4.7
ELXT9	P	42	2	81	1.5	5.4	5.6
KS011	P	162	15	100	5.7	-5.2	7.8
KS037	P	105	9	79	6.5	-4.8	8.1
OULA2	P	23	0	96	1.5	-5.8	6.0
OVUN6	P	72	0	39	2.7	5.0	5.7
OYYK2	P	28	0	71	0.7	5.6	5.7
TEST	P	239	31	95	5.5	-7.4	9.2
UCJB	P	57	2	2	0.8	-4.6	4.7
UCJL	P	32	0	0	1.2	4.4	4.6
UCUC	P	69	100	100			
UIAG	P	58	19	91	3.2	-7.4	8.1
VGJD	P	23	48	87	1.9	13.7	13.8
V2OB1	P	52	4	31	6.4	-3.3	7.2
WXKM	P	20	0	5	0.9	-4.0	4.1
XPYM	P	36	0	3	1.6	4.5	4.8
ZCBD2	P	35	0	100	1.1	11.0	11.0
3FPS9	P	48	0	67	3.1	-4.1	5.1
62166	P	42	0	100	3.9	4.9	6.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CF4	SPEED	28	0	57	2.4	5.4	5.9
DPGD	SPEED	31	0	100	4.6	5.6	7.2
JPBN	SPEED	26	0	0	2.4	5.0	5.5
PBVO	SPEED	20	0	100	1.9	-5.5	5.8
V2AR5	SPEED	61	0	5	2.0	5.5	5.8
V2EA4	SPEED	95	1	23	5.9	5.4	8.0
3ETX6	SPEED	92	0	100	5.2	5.4	7.4
3FEI6	SPEED	28	0	18	3.5	5.0	6.1

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AUBK	DIRN.	24	0	0	27.0	30.0	40.4
A8CG7	DIRN.	22	0	0	25.9	44.6	51.5
C6FU4	DIRN.	21	0	0	82.2	7.3	82.6
FNCI	DIRN.	33	0	0	24.2	36.2	43.6
KS025	DIRN.	36	0	0	98.7	8.6	99.0
KS027	DIRN.	46	0	0	82.7	-35.4	90.0
SP32	DIRN.	25	4	0	82.0	38.1	90.5
23168	DIRN.	46	0	0	41.2	89.7	98.7
62114	DIRN.	38	0	0	21.3	31.1	37.7

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGHL	SST	42	40	43	2.0	0.1	2.0
CG2350	SST	215	27	100	1.9	0.1	1.9
CG2522	SST	541	99	100	0.6	7.3	7.3
CG8048	SST	55	100	100			
C6IZ7	SST	32	3	100	1.9	3.5	4.0
C6OD7	SST	38	0	39	2.4	-3.7	4.4
DBBX	SST	520	69	100	0.4	0.4	0.6
DBBXX	SST	74	73	100	0.4	0.4	0.5
DEDI	SST	552	37	60	0.8	0.3	0.9
DHDH	SST	26	0	46	0.8	-3.2	3.3
EIQN	SST	630	38	100	0.7	0.1	0.7
ELVO5	SST	47	0	43	1.9	3.4	3.9
ELZT3	SST	197	30	69	1.8	-0.9	2.0
KRHX	SST	36	3	100	1.5	-4.1	4.3
KRPB	SST	49	0	100	1.3	-5.4	5.6
KS025	SST	188	40	100	1.1	0.6	1.3
LACF5	SST	23	0	74	1.6	4.5	4.8

LAHV	SST	48	50	71	2.0	2.5	3.2
LALK4	SST	27	0	22	1.1	-3.3	3.4
MSGS4	SST	23	39	48	1.8	-2.6	3.2
MZGK7	SST	34	0	12	0.9	-3.5	3.6
PHPO	SST	48	2	6	0.7	-3.2	3.2
P3FY6	SST	25	0	24	1.4	3.0	3.3
SLCH	SST	25	0	100	0.8	4.0	4.1
SWYM	SST	26	73	77	2.1	-1.9	2.8
TEST	SST	403	100	100			
TSLN	SST	141	0	76	1.4	-4.6	4.8
TSMS	SST	44	0	100	0.8	-3.1	3.2
UCEF	SST	20	0	65	2.1	-3.9	4.4
UCJB	SST	58	2	90	1.4	-5.7	5.9
UCOQ	SST	20	0	15	1.1	-3.0	3.2
UFNO	SST	39	0	69	2.2	-5.1	5.5
UFSZ	SST	52	2	100	0.5	-6.5	6.6
UHRT	SST	25	4	48	1.2	-4.0	4.2
UINM	SST	58	0	100	0.5	3.0	3.1
VGLZ	SST	33	100	100			
VGPY	SST	39	28	31	1.9	-0.2	1.9
VRSR	SST	37	0	100	2.0	5.2	5.6
V2OH1	SST	29	0	72	2.5	-5.1	5.7
WDCJ	SST	38	3	63	2.6	3.5	4.4
WQZ9670	SST	89	0	62	3.4	-3.0	4.5
WUW2120	SST	27	26	48	4.3	-0.6	4.4
WWU8	SST	34	100	100			
YJQL3	SST	25	0	100	1.0	-3.9	4.0
ZCBQ2	SST	29	7	72	2.9	4.1	5.0
ZMFR	SST	177	27	27	0.8	0.3	0.8
31056	SST	397	100	100			
45140	SST	626	100	100			
45141	SST	606	100	100			
45144	SST	445	79	100	2.0	8.3	8.5
45145	SST	603	100	100			
45147	SST	623	100	100			
45148	SST	554	100	100			
45150	SST	621	100	100			
45152	SST	411	100	100			
46050	SST	215	0	60	1.8	-3.2	3.7
46131	SST	631	100	100			
46146	SST	628	100	100			
46181	SST	631	100	100			
9KKS	SST	61	0	57	1.7	-4.2	4.5

Figure 1. SHIP/SYNOP mean daily count. SEPTEMBER 2003
All hours
Global average number of observations in 24 hours = 20837

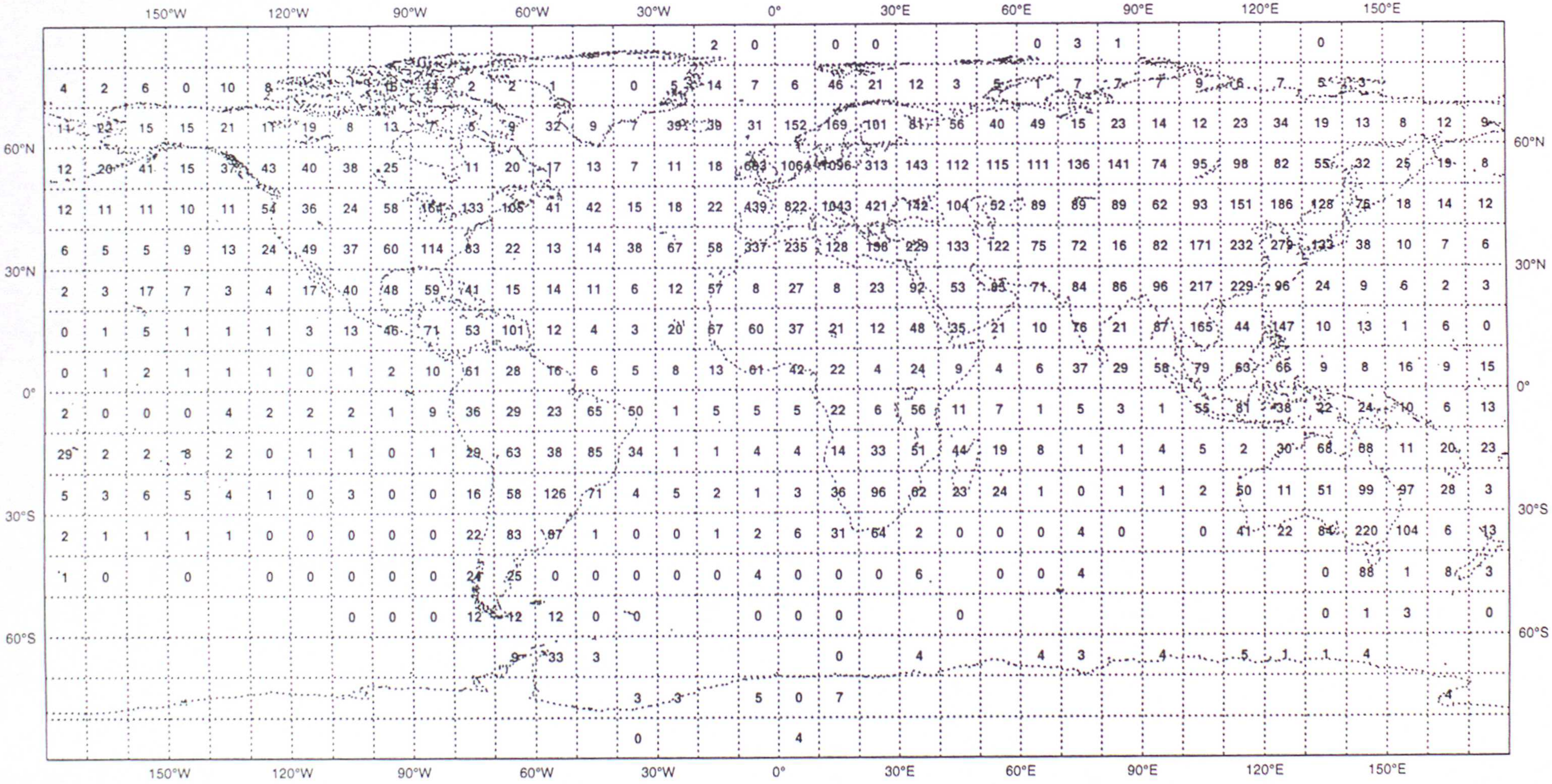

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		: All hours	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.	
	:PGE	:Percentage of observations with gross errors.	
	:%REJ	: Percentage of observations flagged excluding those with gross errors	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1} :10 degrees	(pressure) (vector wind) (sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa ≥ 5 m s^{-1} ≥ 30 degrees ≥ 3 degrees	(pressure), (wind speed), (direction). (sea surface temperature).
	2.SD	≥ 6 hPa ≥ 80 degrees ≥ 5 degrees	(pressure), (direction). (sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
14909	-10.8	82.7	P	214	14	72	4.0	6.1	7.3
33630	-57.3	120.2	P	572	28	79	6.3	0.2	6.3
42565	12.6	-75.9	P	66	98	98	0.0	0.6	0.6
42567	10.7	-76.2	P	107	100	100			
46512	54.1	-151.9	P	61	100	100			
48585	82.0	-110.8	P	541	31	87	6.6	-2.7	7.2
61525	42.2	39.2	P	382	8	63	3.0	-4.2	5.1
61668	37.2	18.9	P	494	43	57	3.1	-2.6	4.1

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
21634	23.4	165.9	SPEED	302	25	100	6.8	8.2	10.6
21635	31.7	137.2	SPEED	261	0	100	4.8	6.6	8.2
41910	25.8	-65.3	SPEED	317	6	100	7.1	5.3	8.9
41912	25.9	-65.2	SPEED	214	6	100	8.0	5.1	9.4

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13599	19.2	-34.6	DIRN.	24	0	0	18.3	-31.4	36.3
41912	25.9	-65.2	DIRN.	124	10	0	27.1	49.9	56.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
15908	-49.0	68.7	SST	206	63	63	0.2	0.0	0.2
42565	12.5	-75.8	SST	94	77	94	2.9	-4.7	5.5
42567	10.7	-76.2	SST	173	75	94	2.8	-4.8	5.5
44507	43.9	-39.7	SST	74	45	93	1.8	-4.8	5.1
46512	54.1	-151.9	SST	99	37	98	5.5	-3.1	6.3
46785	55.2	-172.3	SST	52	27	100	0.8	-8.6	8.7
46972	18.4	-160.8	SST	241	1	100	0.2	4.8	4.8
51661	20.8	121.8	SST	51	100	100			
51769	13.5	151.7	SST	355	0	100	1.2	3.4	3.6
56523	-29.1	108.3	SST	415	1	75	2.0	5.0	5.4

Figure 2. DRIFTER mean daily count. SEPTEMBER 2003
All hours
Global average number of observations in 24 hours = 12252

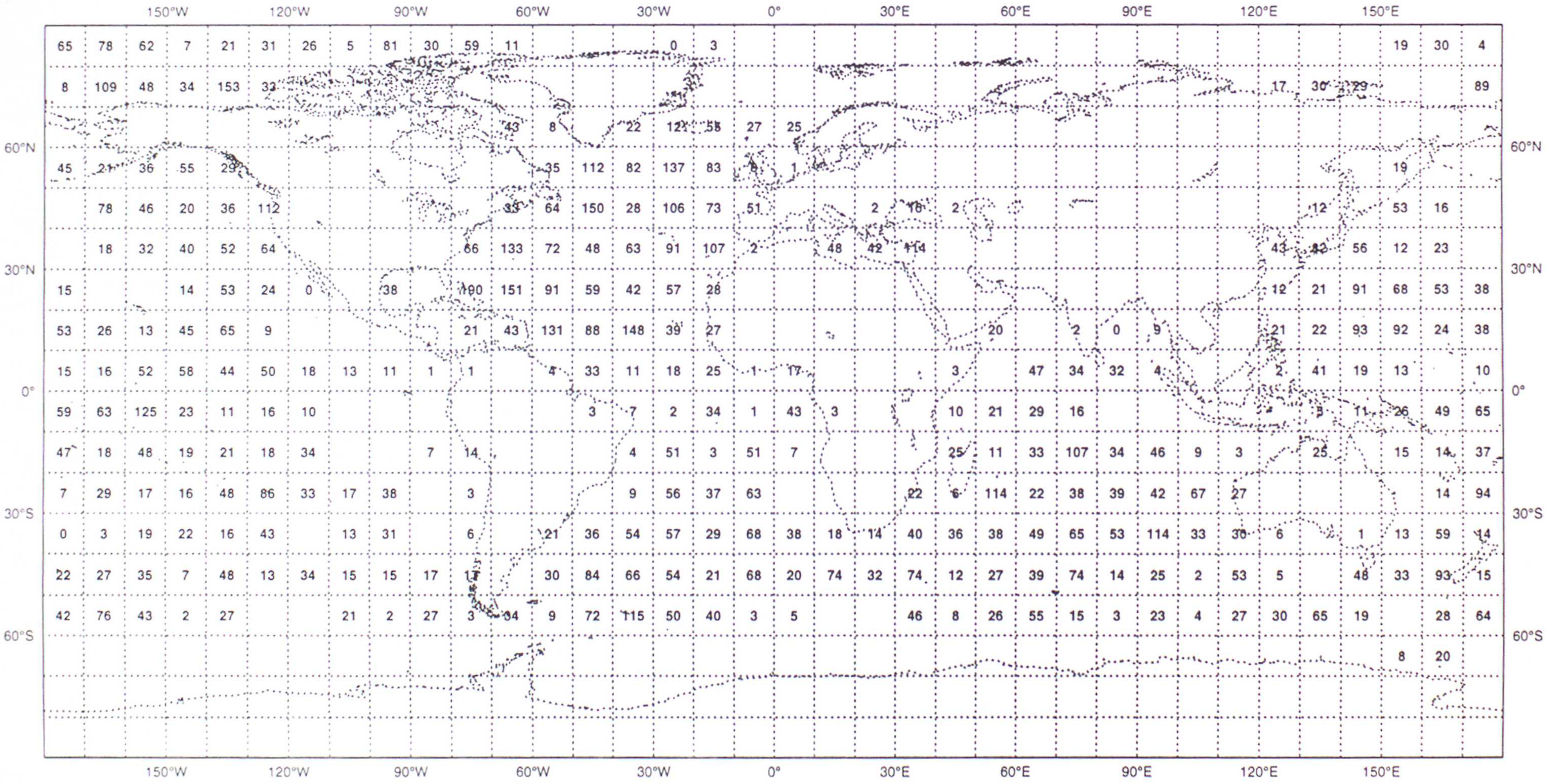

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
65 78 62 7 21 31 26 5 81 30 59 11 0 3 19 30 4
8 109 48 34 153 32 17 30 29 89
43 8 22 12 55 27 25
45 21 36 55 29 35 112 82 137 83 8 1 19
78 46 20 36 112 33 64 150 28 106 73 51 2 10 2 12 53 16
18 32 40 52 64 66 133 72 48 63 91 107 2 48 42 114 43 42 56 12 23
15 14 53 24 0 38 190 151 91 59 42 57 28 12 21 91 68 53 38
53 26 13 45 65 9 21 43 131 88 148 39 27 20 2 0 9 21 22 93 92 24 38
15 16 52 58 44 50 18 13 11 1 1 4 33 11 18 25 1 17 3 47 34 32 4 2 41 19 13 10
59 63 125 23 11 16 10 3 7 2 34 1 43 3 10 21 29 16 3 11 26 49 65
47 18 48 19 21 18 34 7 14 4 51 3 51 7 25 11 33 107 34 46 9 3 25 15 14 37
7 29 17 16 48 86 33 17 38 3 9 56 37 63 22 6 114 22 38 39 42 67 27 14 94
0 3 19 22 16 43 13 31 6 21 36 54 57 29 68 38 18 14 40 36 38 49 65 53 114 33 30 6 1 13 59 14
22 27 35 7 48 13 34 15 15 17 17 30 84 66 54 21 68 20 74 32 74 12 27 39 74 14 25 2 53 5 48 33 93 15
42 76 43 2 27 21 2 27 3 34 9 72 115 50 40 3 5 46 8 26 55 15 3 23 4 27 30 65 19 28 64
8 20

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION SEP 2003

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	62	0	0	74	2.0	-9.3	9.5
60728	36.4N	10.7E	1	MS	63	1	2	2	0.6	-8.3	8.3
61492	16.1N	13.5W	18	MS	52	1	2	0	1.0	4.6	4.7
62056	32.8N	21.8E	625	S8	68	1	1	47	0.9	-5.0	5.1
63801	4.9S	29.6E	882	S8	69	4	6	7	2.7	7.2	7.7
63881	8.0S	31.6E	1923	S	37	4	11	3	0.9	13.4	13.4
65355	9.8N	1.1E	342	MS	89	0	0	0	0.8	-13.4	13.4
66285	11.8S	19.9E	1357	8	20	17	85	0	0.2	14.5	14.5
68014	19.6S	18.1E	1411	S8	70	0	0	0	0.6	-6.6	6.6
68030	18.5S	25.6E	1071	S8	88	0	0	0	4.0	9.1	9.9
68312	26.5S	18.1E	1067	S8	70	0	0	0	0.8	4.3	4.4
68338	26.9S	24.6E	1234	S8	61	61	100	0			
68396	26.5S	31.3E	641	S8	54	0	0	0	1.1	4.6	4.7
68575	30.0S	30.0E	1175	S8	114	114	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	117	0	0	0	5.2	5.5	7.6
36982	41.9N	78.2E	3635	S7	114	1	1	1	1.2	6.3	6.4
38565	40.6N	65.7E	485	MS	115	59	51	0	2.9	0.0	2.9
40435	24.5N	44.4E	991	MS	56	0	0	0	0.6	7.8	7.8
40700	39.6N	47.9E	45	MS	105	1	1	0	0.9	-5.2	5.3
40713	37.4N	46.3E	1475	MS	112	8	7	0	0.8	13.0	13.0
40726	36.8N	45.7E	1384	MS	109	0	0	1	0.8	4.0	4.1
40741	36.5N	61.2E	235	MS	112	0	0	0	0.6	-5.0	5.0
40780	33.6N	46.4E	1362	MS	110	0	0	0	0.5	5.4	5.4
41254	23.1N	57.6E	1755	S8	85	85	100	0			
44265	46.1N	91.5E	1186	MS	110	0	0	1	1.4	5.7	5.9
44416	28.6N	81.6E	720	MS	57	0	0	0	1.0	4.7	4.8
47022	40.8N	128.2E	1224	S	102	0	0	1	1.1	4.3	4.4
47678	33.1N	139.8E	79	MS	117	0	0	100	1.1	-8.6	8.7
50727	47.2N	119.9E	1028	MS	117	0	0	0	0.6	4.3	4.3
51495	43.2N	91.7E	874	M	117	0	0	0	0.9	7.0	7.1
56462	29.0N	101.5E	2994	S	117	0	0	0	1.1	8.1	8.2
56768	25.0N	101.5E	1773	S	117	0	0	0	0.6	-5.3	5.3
57816	26.6N	106.7E	1074	MS	117	73	62	0	0.3	-14.6	14.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80315	3.0N	75.3W	439	MS	86	0	0	0	1.3	-4.2	4.4
82181	2.0S	54.1W	146	MS	76	1	1	1	0.8	5.7	5.8
82765	7.3S	47.5W	193	MS	76	0	0	0	0.5	4.0	4.0
83235	12.4S	46.4W	604	MS	81	1	1	0	0.7	6.9	6.9
83332	14.1S	46.4W	826	MS	80	52	65	0	0.6	14.4	14.4
83470	17.9S	50.9W	727	MS	79	0	0	0	1.1	-5.4	5.5
83531	18.6S	46.5W	940	MS	84	0	0	1	1.2	-6.2	6.3
83738	22.5S	44.5W	440	MS	49	0	0	78	1.2	-7.7	7.8
83836	25.5S	50.6W	837	MS	85	0	0	0	0.9	-5.4	5.5
84377	3.8S	73.3W	125	MS	114	0	0	0	1.0	4.5	4.6
84401	5.2S	80.6W	49	MS	115	0	0	1	1.0	4.4	4.5
84425	5.9S	76.1W	179	MS	25	0	0	0	1.2	4.3	4.5
84455	6.5S	76.4W	281	MS	83	0	0	1	1.6	8.2	8.4
84472	7.1S	78.5W	2620	S	58	0	0	0	0.9	-5.5	5.6
84474	7.2S	76.7W	350	S	25	1	4	0	1.2	9.2	9.3
84686	13.6S	72.0W	3248	S	114	0	0	0	1.0	-4.9	5.0
84688	13.7S	73.4W	3444	S	50	0	0	0	0.5	-12.6	12.6
84720	14.9S	75.0W	567	MS	57	0	0	0	0.8	5.7	5.8

84782	18.1S	70.3W	468	MS	92	0	0	1	1.3	8.0	8.1
85140	14.3S	67.4W	140	MS	55	0	0	0	1.2	7.1	7.2
85264	18.5S	64.1W	1998	S	57	4	7	0	2.0	-10.5	10.7
85312	19.8S	63.9W	992	S	47	4	9	0	1.8	-11.6	11.7
85406	18.3S	70.3W	55	M	114	0	0	0	0.9	4.5	4.6
85432	22.5S	68.9W	2320	S8	79	1	1	0	0.5	4.6	4.6

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	113	0	0	2	1.3	4.6	4.8
71049	66.0N	91.8W	150	S	73	51	70	0	1.6	13.6	13.7
71181	47.1N	55.3W	29	MS	116	0	0	0	0.6	-5.6	5.6
71408	47.4N	55.8W	35	MS	116	0	0	61	0.7	-4.4	4.5
71475	49.3N	124.8W	2	MS	116	0	0	0	0.9	-8.3	8.3
71747	48.8N	91.6W	424	MS	111	0	0	0	0.6	4.2	4.2
72327	36.1N	86.7W	182	MS	117	0	0	0	0.6	4.4	4.4
76055	31.0N	114.9W	440	MS	71	71	100	0			
76543	22.0N	98.8W	104	MS	30	0	0	0	0.6	7.0	7.0
76762	17.5N	99.5W	1265	MS	63	1	2	3	1.3	5.8	5.9
76903	14.9N	92.3W	118	MS	71	0	0	0	0.8	6.3	6.4
78588	17.2N	87.5W	-271	M	115	97	84	0	0.4	0.0	0.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	31	0	0	71	1.0	8.6	8.7
94130	14.8S	131.9E	120	MS	118	0	0	0	1.2	4.9	5.0
96505	3.7N	115.7E	-9999	8	48	48	100	0			
97378	10.7S	123.1E	1	MS	46	45	98	0	0.0	-14.7	14.7

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	115	0	0	0	0.7	5.9	5.9
06685	47.0N	9.1E	515	MS	117	0	0	0	1.0	6.4	6.5
08912	42.9N	0.8W	1434	MS	353	353	100	0			
08922	42.8N	0.2W	1660	MS	316	316	100	0			
10850	48.8N	10.7E	457	MS	353	0	0	0	0.4	-5.5	5.5
11116	47.5N	10.8E	870	MS	56	2	4	0	0.7	4.2	4.3
13269	44.3N	19.9E	176	MS	117	1	1	1	0.6	7.6	7.6
14554	44.9N	18.4E	136	S	34	1	3	3	0.6	-13.1	13.1
14650	43.8N	18.0E	970	S	34	34	100	0			
16344	39.3N	16.4E	1710	S8	82	0	0	1	1.1	5.1	5.2
16538	40.1N	9.3E	1022	S	32	0	0	0	0.9	8.9	8.9
17203	38.9N	40.5E	1177	S8	116	0	0	0	0.8	5.2	5.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	94	0	0	0	1.5	-8.0	8.1
89263	66.0S	66.1W	20	M	285	54	19	0	9.1	7.0	11.5
89264	71.4S	68.9W	780	S	287	0	0	0	1.4	6.8	6.9
89272	75.0S	70.8W	1395	S	145	145	100	17			
89512	70.8S	11.8E	140	MS	117	0	0	0	1.3	-4.3	4.5
89528	82.8S	29.0E	2912	S	23	0	0	17	3.3	7.0	7.7
89610	65.9S	113.1E	90	M	300	0	0	0	1.5	-7.4	7.6
89614	66.6S	111.2E	500	S	307	307	100	0			
89744	74.0S	43.1E	3353	S	302	0	0	0	0.8	7.6	7.6
89811	66.7S	112.8E	1366	S	301	0	0	0	1.1	-4.5	4.6
89868	79.9S	170.0E	60	S	318	0	0	1	1.5	-4.1	4.4

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	2888	0	38	1.2	0.3	2825	0	38	0	4.9	0.7
AAL	5858	1	34	1.5	0.3	5640	0	34	0	5.6	0.4
AAR	1419	0	4	1.4	-0.2	1394	0	5	0	7.3	0.3
ABD	21	0	0	1.6	-0.5	20	0	0	0	5.8	0.7
ACA	2782	0	4	1.5	-0.1	2507	0	4	0	7.5	0.1
ADB	21	0	5	2.3	-1.6	22	0	9	0	9.7	-3.5
AEA	1093	0	3	1.7	0.4	750	0	3	0	7.3	0.4
AEL	538	1	8	1.6	0.0	463	1	10	0	7.2	1.1
AEW	66	0	2	1.4	-0.5	70	0	17	0	14.7	0.2
AFL	687	0	5	2.0	0.5	590	1	5	0	8.0	0.4
AFR	1454	1	7	1.4	0.1	1270	0	7	0	7.1	0.9
AIS	260	1	8	1.6	-0.6	245	0	8	0	8.6	0.7
AJM	396	0	2	1.3	-0.1	364	0	4	0	8.8	0.6
AJX	585	0	4	1.6	0.8	567	0	5	0	7.4	0.6
AMM	157	0	2	1.6	0.5	142	0	6	0	9.8	-0.3
AMT	1406	0	38	0.9	-0.1	1406	0	39	0	5.5	0.3
AMX	303	1	5	1.4	0.3	263	1	9	0	8.4	0.7
ANA	59	0	0	1.7	0.9	57	2	5	0	8.8	1.9
ANZ	4421	0	26	1.3	0.0	4397	0	25	0	6.0	0.3
ARG	46	7	24	2.7	-0.1	35	0	23	0	13.4	2.5
ATN	95	3	100	3.4	-2.3	93	0	19	0	9.9	4.3
AVA	211	0	0	1.9	1.4	160	0	2	0	6.7	0.7
AVN	141	1	45	0.9	0.0	141	0	45	0	4.9	0.1
AXF	28	4	21	1.6	-0.8	28	0	18	0	5.6	-1.1
AZA	646	7	22	2.8	0.5	589	0	8	0	8.8	0.0
BAL	209	0	3	1.3	0.2	185	0	5	0	7.1	0.9
BAW	837	0	10	1.8	-0.3	786	0	9	0	7.6	0.5
BBR	153	1	7	2.2	0.7	113	0	6	0	9.8	2.0
BPA	241	34	44	3.0	1.2	219	0	6	0	8.5	-0.5
BSK	70	0	16	1.8	0.3	71	1	20	0	10.4	0.6
BWA	306	0	4	1.4	0.2	262	0	5	0	7.2	0.9
CAL	45	0	13	2.0	0.4	46	0	15	0	10.2	-1.3
CCA	236	2	17	2.4	0.4	253	1	77	0	11.0	-0.6
CES	188	0	5	1.5	-0.1	188	1	10	0	9.6	-0.1
CFC	32	0	9	1.9	-1.1	31	0	16	0	10.1	-0.2
CFG	799	2	5	1.6	-0.2	666	0	4	0	7.0	0.3
CGB	21	5	10	2.0	-0.6	21	0	0	0	7.2	0.9
CKK	81	0	7	1.5	0.3	84	0	7	0	6.0	-0.1
CKS	349	7	30	1.7	0.6	356	1	26	0	9.5	0.7
CLX	356	0	3	1.9	-0.5	283	0	2	0	6.4	0.1
COA	157	0	31	1.4	0.3	142	1	38	0	10.3	0.5
CPA	56	0	21	1.2	0.1	57	0	21	0	5.1	-0.2
CRL	466	0	5	1.4	0.3	378	0	6	0	8.0	0.7
CSN	86	1	5	1.5	0.0	84	1	7	0	8.7	0.4
CUB	208	0	2	1.5	0.3	182	0	5	0	10.1	0.4
DAL	3066	0	33	1.3	-0.1	2954	0	34	0	6.1	0.2
DBR	37	0	3	1.8	0.1	39	3	3	0	5.2	1.1
DCE	161	1	5	1.5	-0.8	153	0	4	0	6.1	-0.2
DCS	36	6	22	2.6	-0.2	36	0	22	0	11.1	-0.1
DHL	162	1	100	6.5	-6.4	158	0	100	0	17.6	3.2
DLH	1239	1	16	1.8	-0.1	1154	0	17	0	7.3	0.9
EDW	101	1	4	1.0	-0.1	96	0	3	0	5.1	1.3
EEZ	81	2	20	2.8	1.2	79	0	8	0	5.3	0.9
EIA	370	0	17	2.2	1.1	355	1	100	0	17.0	3.9
ELY	205	0	2	1.3	0.1	202	0	2	0	5.9	0.2
EVA	85	1	5	1.7	-0.3	102	1	5	0	8.4	-0.7
FDX	2017	1	40	1.3	0.3	2013	0	40	0	7.6	0.4
FIN	255	0	3	1.5	0.1	241	0	3	0	6.4	0.6
FJI	862	1	39	1.6	0.6	842	0	39	0	6.8	0.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

FLC	25	0	28	2.2	0.5	25	0	24	0	8.2	-0.5
FOM	684	0	34	1.5	0.1	679	1	35	0	5.9	0.8
GAF	51	0	2	1.4	-0.8	48	0	2	0	8.9	0.2
GCO	297	1	6	1.3	0.3	298	0	80	0	7.2	1.1
GRL	49	0	6	2.8	0.4	46	0	2	0	8.6	0.4
GTI	213	0	10	2.0	0.6	217	0	11	0	8.7	0.0
HAL	4332	0	37	1.0	0.0	4232	0	38	0	4.9	0.4
HLN	92	1	2	1.5	-0.9	86	0	1	0	6.0	1.0
HRH	95	0	54	1.2	0.1	95	0	53	0	6.0	0.3
IBE	2806	1	5	1.6	0.4	2209	0	6	0	7.0	0.7
ICE	795	0	2	1.4	0.0	769	0	4	0	8.3	0.8
IWD	426	0	3	1.3	0.3	338	0	4	0	6.0	1.3
JAA	89	1	7	2.5	1.5	78	0	3	0	5.4	1.4
JAL	2460	0	3	1.7	0.6	2420	0	4	0	7.4	0.4
JAZ	1173	0	3	1.8	1.3	1140	0	3	0	7.0	0.6
JBU	21	10	10	0.6	0.2	23	0	13	0	12.5	2.0
KAL	2536	0	7	1.6	0.1	2510	0	8	0	7.5	0.0
KLM	1692	0	4	1.6	0.1	1478	0	4	0	6.9	0.7
LAN	522	0	5	1.5	-0.1	519	1	6	0	6.5	1.1
LAP	79	3	42	2.7	0.8	77	0	42	0	10.4	2.6
LDA	30	0	7	1.4	0.6	25	0	8	0	8.7	-2.3
LDI	500	2	16	2.9	0.7	397	1	4	0	8.5	0.1
LOT	120	2	8	1.9	-1.1	116	0	8	0	8.1	2.2
LTU	833	2	6	1.6	-0.2	692	0	4	0	7.0	1.1
LXR	83	0	4	1.3	0.5	71	0	6	0	7.5	0.7
MAS	259	0	3	1.4	0.3	255	0	4	0	7.1	0.4
MMZ	30	0	0	2.5	2.0	25	0	0	0	5.5	2.2
MON	137	1	2	1.5	0.2	123	0	2	0	7.0	0.8
MPD	423	1	8	2.3	0.9	339	0	3	0	7.3	0.6
MPH	764	1	4	1.8	-0.8	707	0	4	0	7.7	0.0
MYT	350	0	4	1.6	-0.1	334	0	2	0	6.7	0.9
NAO	204	0	33	1.1	-0.1	206	0	36	0	8.0	1.1
NCA	1111	1	3	1.8	0.4	816	0	3	0	7.4	-0.2
NWA	8563	1	9	1.6	0.3	8457	0	9	0	7.4	0.2
NZL	3466	0	10	1.6	-0.4	3466	0	9	0	5.1	0.7
OAE	539	1	31	1.1	-0.1	533	1	40	0	10.1	1.6
OOM	170	0	6	1.8	0.7	137	0	9	0	9.8	-0.4
PAC	601	0	17	1.8	0.4	601	0	17	0	8.7	0.6
PAL	1171	0	5	1.5	0.2	1092	0	5	0	7.8	0.6
PAO	325	0	59	1.6	0.4	326	0	59	0	5.4	0.5
PLM	300	0	5	1.8	1.1	176	0	4	0	8.5	0.6
PUA	26	0	35	2.4	0.3	24	0	38	0	8.5	-0.9
QFA	3224	0	48	1.3	0.0	3216	0	48	0	5.7	0.0
QQA	49	4	49	1.2	0.0	51	0	49	0	7.6	1.5
RAF	40	0	0	1.4	0.7	40	0	0	0	6.8	0.5
RAM	255	0	8	2.3	0.9	164	1	80	0	9.0	-0.4
RCH	304	1	20	2.7	0.7	257	0	78	0	9.2	0.9
RRR	155	1	14	2.1	-0.2	153	1	12	0	8.4	0.6
RYN	20	0	100	0.8	-0.3	20	0	30	0	6.9	2.8
RZO	426	0	5	1.5	-0.4	277	0	5	0	7.4	1.0
SAA	400	1	3	1.5	-0.3	350	0	3	0	8.2	0.3
SEU	114	0	4	1.6	0.2	114	0	5	0	10.0	0.6
SIA	267	0	1	1.4	0.1	267	0	1	0	5.0	0.6
SLR	239	0	5	1.4	0.1	227	0	5	0	7.3	0.2
SQC	54	0	4	1.4	0.2	54	0	2	0	5.3	0.9
SSV	36	0	0	1.3	-0.4	35	0	3	0	6.0	1.0
SVA	35	0	3	1.1	0.1	32	0	0	0	4.9	0.0
TAG	43	0	12	2.0	0.9	47	0	17	0	8.3	0.0
TAM	29	3	52	2.5	1.7	30	3	57	0	17.8	3.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAP	505	1	3	1.3	-0.1	248	1	7	0	9.5	0.3

TCX	92	0	3	1.1	0.7	82	0	5	0	8.0	1.0
THA	97	0	3	1.4	0.0	98	0	4	0	6.7	0.0
THT	147	1	27	1.6	0.7	139	0	26	0	7.3	1.1
TPA	35	0	0	1.2	0.5	32	0	0	0	6.2	0.3
TSC	195	1	4	1.6	-0.1	177	0	5	0	8.2	0.8
UAE	107	0	4	1.4	0.1	106	0	4	0	5.1	1.7
UAL	112712	0	93	1.0	-0.2	112749	0	92	0	4.7	0.4
UPS	1905	0	55	1.5	0.0	1869	0	55	0	7.3	0.4
USA	51	4	12	1.7	0.2	49	0	12	0	11.0	-0.9
VIR	177	1	1	1.4	0.0	171	1	6	0	8.2	0.5
VPB	23	4	13	1.8	0.5	22	0	14	0	11.1	-2.3
VRG	99	5	38	2.3	0.7	98	0	100	0	10.6	-0.2
VVJ	46	2	26	1.5	-0.2	50	0	26	0	12.3	2.0
VVR	72	0	21	1.9	0.5	68	0	21	0	6.4	1.5
WOA	484	0	8	1.2	0.2	486	0	11	0	8.9	0.8
YSS	194	1	3	1.8	1.1	154	0	4	0	8.1	0.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AR	566	0	100	3.0	2.7	565	0	4	0	5.9	0.4
AU	37182	0	9	1.2	0.4	37184	0	9	0	5.1	0.6
EU	175073	0	27	1.2	0.4	175073	0	26	0	4.5	0.4
KL	2237	0	4	1.3	0.8	2233	0	4	0	6.0	0.0
MK	3327	0	100	1.7	1.4	3313	0	7	0	6.5	1.3
SA	4285	0	12	1.7	1.2	4045	0	5	0	5.8	0.1
TN	38	0	29	2.8	1.7	36	0	25	0	8.9	0.2
N	761	1	15	2.2	0.9	761	0	16	0	8.2	1.0
US ACARS	831541	0	61	1.2	0.3	831531	0	61	0	5.0	0.5

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	80	0	33	1.3	-0.1	76	0	30	0	3.9	0.7
AFR	61	2	7	1.3	0.2	59	0	8	0	8.6	0.8
ANZ	181	0	27	1.0	-0.1	182	0	26	0	5.3	1.1
AVN	32	6	44	1.4	-0.1	32	0	41	0	6.3	0.1
AXF	47	0	64	2.1	0.2	44	0	61	0	5.8	1.0
AZA	22	0	9	3.0	0.9	22	0	5	0	7.6	0.8
BAF	20	10	25	3.3	0.4	21	0	10	0	9.5	1.3
CFC	45	0	7	1.0	0.2	48	0	8	0	4.8	-0.5
CFG	31	3	3	0.9	-0.1	32	0	3	0	8.6	0.0
CKS	41	2	37	3.4	-0.9	42	0	19	0	5.8	0.5
DAL	100	4	31	1.6	-0.4	99	0	27	0	4.9	0.2
DLH	232	1	14	1.8	-0.2	223	0	12	0	5.4	0.0
EIA	29	0	24	2.3	0.9	29	3	100	0	22.8	6.6
FDX	365	0	25	1.4	0.3	362	0	27	0	8.3	0.8
GAF	76	4	5	1.2	0.1	80	0	3	0	7.4	0.0
GCO	117	0	4	1.6	0.4	114	1	93	0	12.6	1.0
GTI	20	0	5	1.9	0.2	22	0	9	0	9.0	-1.0
HAL	131	0	42	1.2	0.0	128	0	41	0	5.0	0.4
IBE	29	3	17	2.8	0.9	29	0	17	0	9.2	1.7
JAL	32	0	6	1.3	0.1	32	0	13	0	15.5	1.5
JAZ	51	0	0	1.6	1.4	48	0	0	0	6.2	-1.6
KAL	41	0	12	2.0	-0.8	41	0	10	0	7.4	-0.4
KIW	46	4	50	4.1	2.0	46	2	41	0	7.6	1.2
KLM	31	0	6	1.4	0.3	32	0	6	0	5.7	1.7
LAN	32	0	6	1.0	-0.1	34	0	3	0	5.6	0.8
MAS	25	0	28	1.1	-0.4	25	0	28	0	3.8	0.0
MPH	60	2	5	1.5	-0.2	57	0	5	0	6.4	0.8
MYT	30	0	0	1.3	0.4	28	0	4	0	11.5	1.1
NCA	81	0	0	1.7	0.5	72	0	0	0	6.1	0.1
NWA	337	1	6	1.6	0.2	330	1	6	0	7.4	-0.9
NZL	19567	0	55	1.1	0.1	19567	0	54	0	5.2	-0.2
PAC	37	3	22	3.3	0.6	38	0	8	0	7.6	1.4
PAL	42	0	14	1.4	-0.3	38	0	13	0	4.3	0.9
QFA	244	0	48	1.5	-0.1	246	0	47	0	5.0	1.4
RCH	35	0	6	2.2	0.2	36	0	61	0	10.2	1.9
RRR	186	5	17	2.4	1.2	184	0	17	0	9.8	0.7
SIA	35	0	0	1.1	0.5	36	0	0	0	5.5	1.5
UAE	20	0	10	0.9	0.1	20	0	10	0	5.4	1.9
UAL	218794	0	99	1.1	-0.1	218578	0	99	0	4.0	0.4
UPS	120	2	49	1.3	-0.2	113	0	50	0	6.0	-0.1
VVP	26	0	19	2.4	-1.1	27	0	19	0	7.6	3.1
WOA	143	2	8	1.6	0.5	143	0	13	0	10.5	0.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AR	310	0	100	1.9	1.0	310	0	48	0	5.4	0.9
AU	36541	0	53	1.3	0.4	36544	0	53	0	4.6	-0.3
EU	768727	0	70	1.0	0.2	768600	0	70	0	3.6	0.0
KL	1606	0	53	1.5	0.3	1604	0	53	0	4.5	0.5
MK	2093	0	100	1.2	0.5	2078	0	50	0	4.2	0.6
SA	2706	0	61	1.5	0.4	2475	0	60	0	4.9	-0.1
N	26	8	15	2.8	0.8	26	0	19	0	14.8	2.9
US ACARS	1534644	0	78	1.1	0.2	1529342	0	78	0	3.9	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 41684

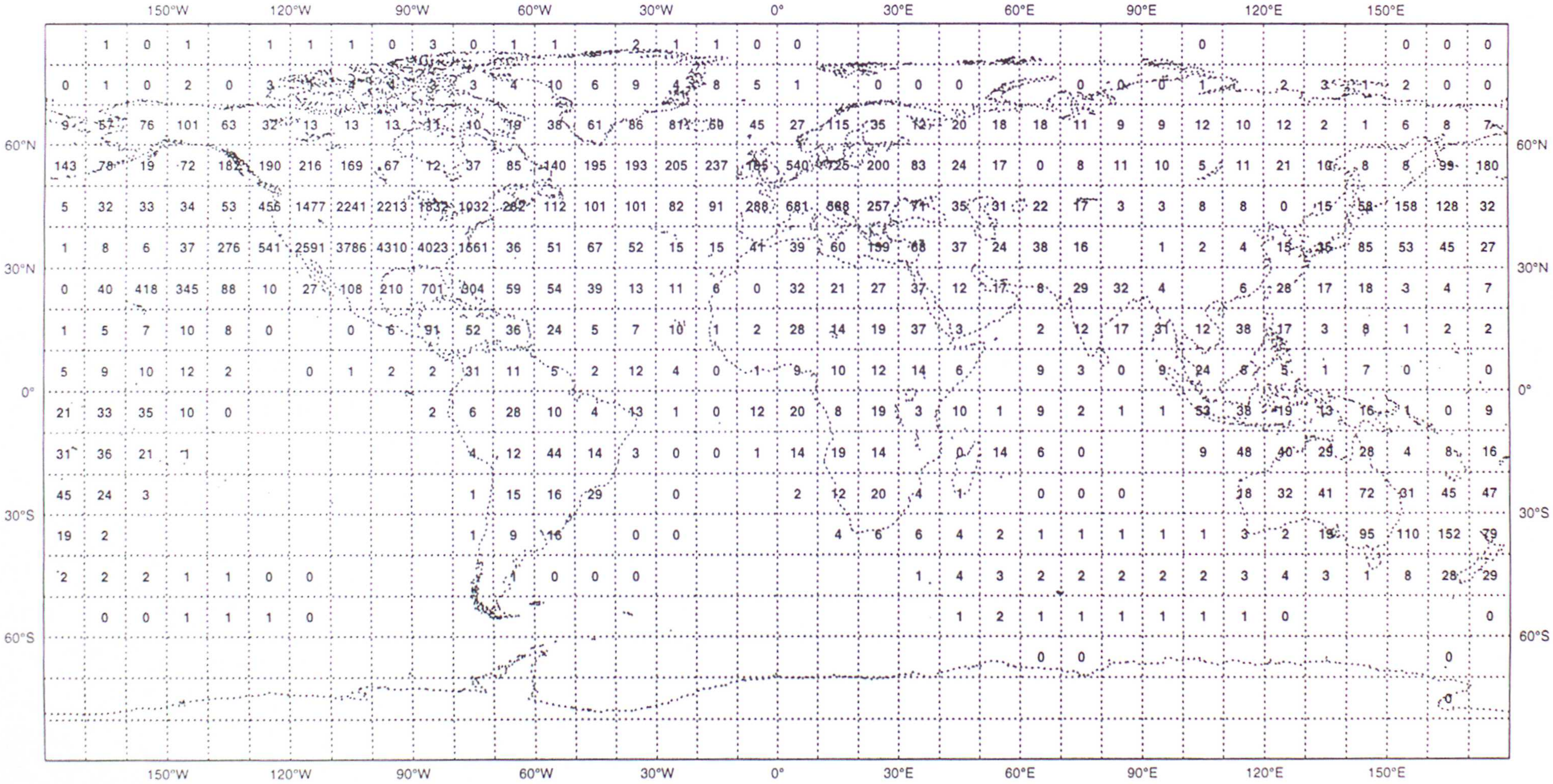

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 0 1 1 1 1 0 3 0 1 1 2 1 1 0 0 0 0 0 0
0 1 0 2 0 3 3 4 10 6 9 4 8 5 1 0 0 0 0 0 0 1 2 3 1 2 0 0
9 57 76 101 63 32 13 13 13 11 10 19 38 61 86 81 60 45 27 115 35 12 20 18 18 11 9 9 12 10 12 2 1 6 8 7
143 78 19 72 182 190 216 169 67 12 37 85 140 195 193 205 237 185 540 4725 200 83 24 17 0 8 11 10 5 11 21 10 8 8 99 180
5 32 33 34 53 456 1477 2241 2213 1832 1032 282 112 101 101 82 91 288 681 688 257 71 35 31 22 17 3 3 8 8 0 15 58 158 128 32
1 8 6 37 276 541 2591 3786 4310 4023 1661 36 51 67 52 15 15 41 39 60 139 68 37 24 38 16 1 2 4 15 35 85 53 45 27
0 40 418 345 88 10 27 108 210 701 304 59 54 39 13 11 6 0 32 21 27 37 12 17 8 29 32 4 6 28 17 18 3 4 7
1 5 7 10 8 0 0 6 91 52 36 24 5 7 10 1 2 28 14 19 37 3 2 12 17 31 12 38 17 3 8 1 2 2
5 9 10 12 2 0 1 2 2 31 11 5 2 12 4 0 1 9 10 12 14 6 9 3 0 9 24 8 5 1 7 0 0
21 33 35 10 0 2 6 28 10 4 13 1 0 12 20 8 19 3 10 1 9 2 1 1 53 38 19 13 16 1 0 9
31 36 21 1 4 12 44 14 3 0 0 1 14 19 14 0 14 6 0 9 48 40 29 28 4 8 16
45 24 3 1 15 16 29 0 2 12 20 4 1 0 0 0 18 32 41 72 31 45 47
19 2 1 9 16 0 0 4 6 6 4 2 1 1 1 1 1 3 2 19 95 110 152 79
2 2 2 1 1 0 0 1 0 0 0 1 4 3 2 2 2 2 2 3 4 3 1 8 28 29
0 0 1 1 1 0 1 2 1 1 1 1 1 1 0 0
0 0 0
0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 86086

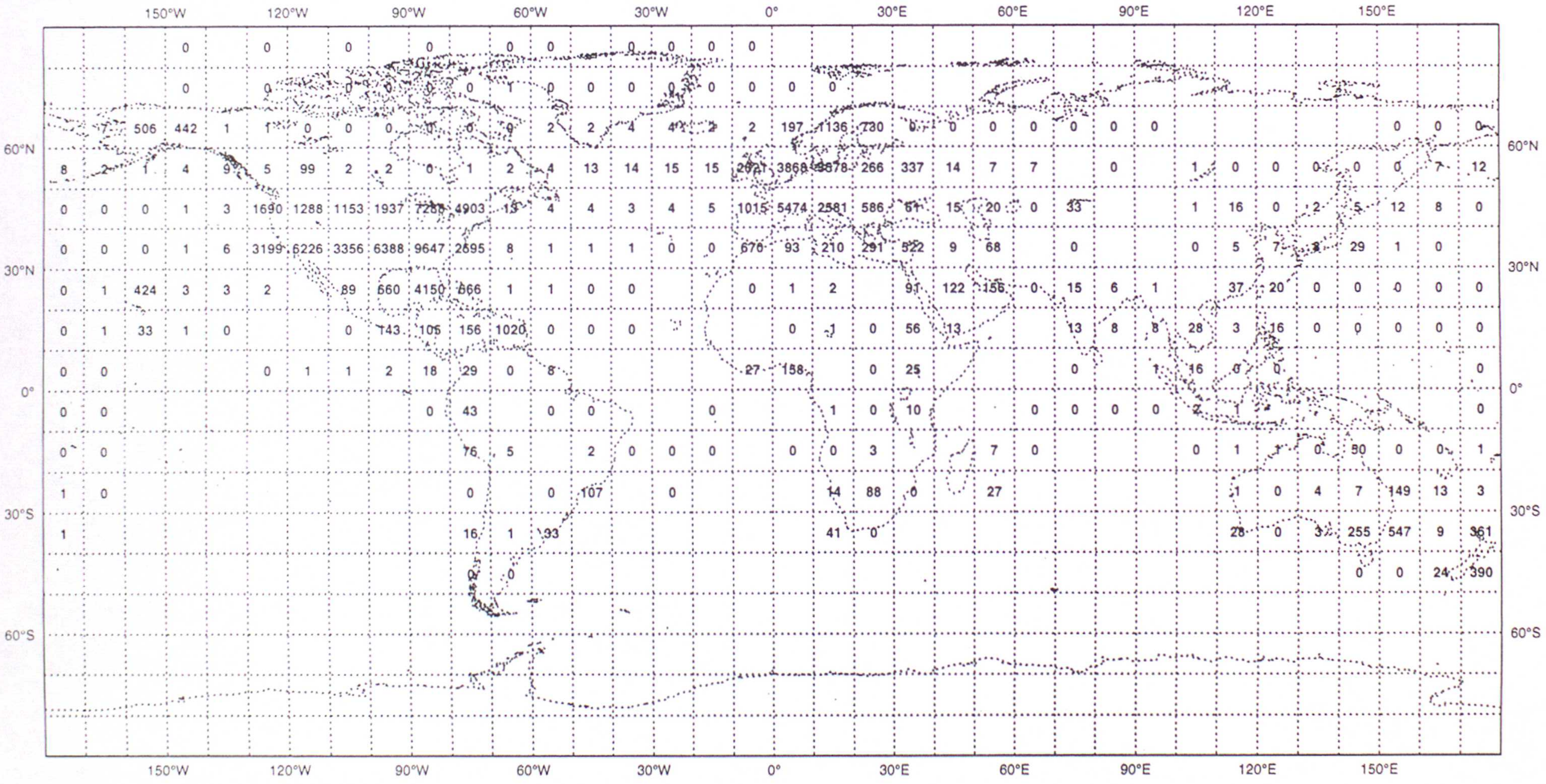

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 1 0 0 0 0 0 0 0 0
7 506 442 1 1 0 0 0 0 0 2 2 4 4 2 2 197 1136 730 0 0 0 0 0 0 0 0 0 0
8 2 1 4 9 5 99 2 2 0 1 2 4 13 14 15 15 2021 3868 3878 266 337 14 7 7 0 1 0 0 0 0 0 7 12
0 0 0 1 3 1690 1288 1153 1937 7288 4903 13 4 4 3 4 5 1015 5474 2581 586 61 15 20 0 33 1 16 0 2 5 12 8 0
0 0 0 1 6 3199 6226 3356 6388 9647 2695 8 1 1 1 0 0 676 93 210 291 522 9 68 0 0 5 7 3 29 1 0
0 1 424 3 3 2 89 660 4150 666 1 1 0 0 0 1 2 91 122 156 0 15 6 1 37 20 0 0 0 0 0
0 1 33 1 0 0 143 105 156 1020 0 0 0 0 1 0 56 13 13 8 8 28 3 16 0 0 0 0 0
0 0 0 1 1 2 18 29 0 8 27 158 0 25 0 1 16 0 0 0
0 0 0 43 0 0 0 1 0 10 0 0 0 0 2 0
0 0 76 5 2 0 0 0 0 0 3 7 0 0 1 1 0 50 0 0 1
1 0 0 0 107 0 14 88 0 27 1 0 4 7 149 13 3
1 16 1 33 41 0 28 0 3 255 547 9 361
0 0 0 0 24 390

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

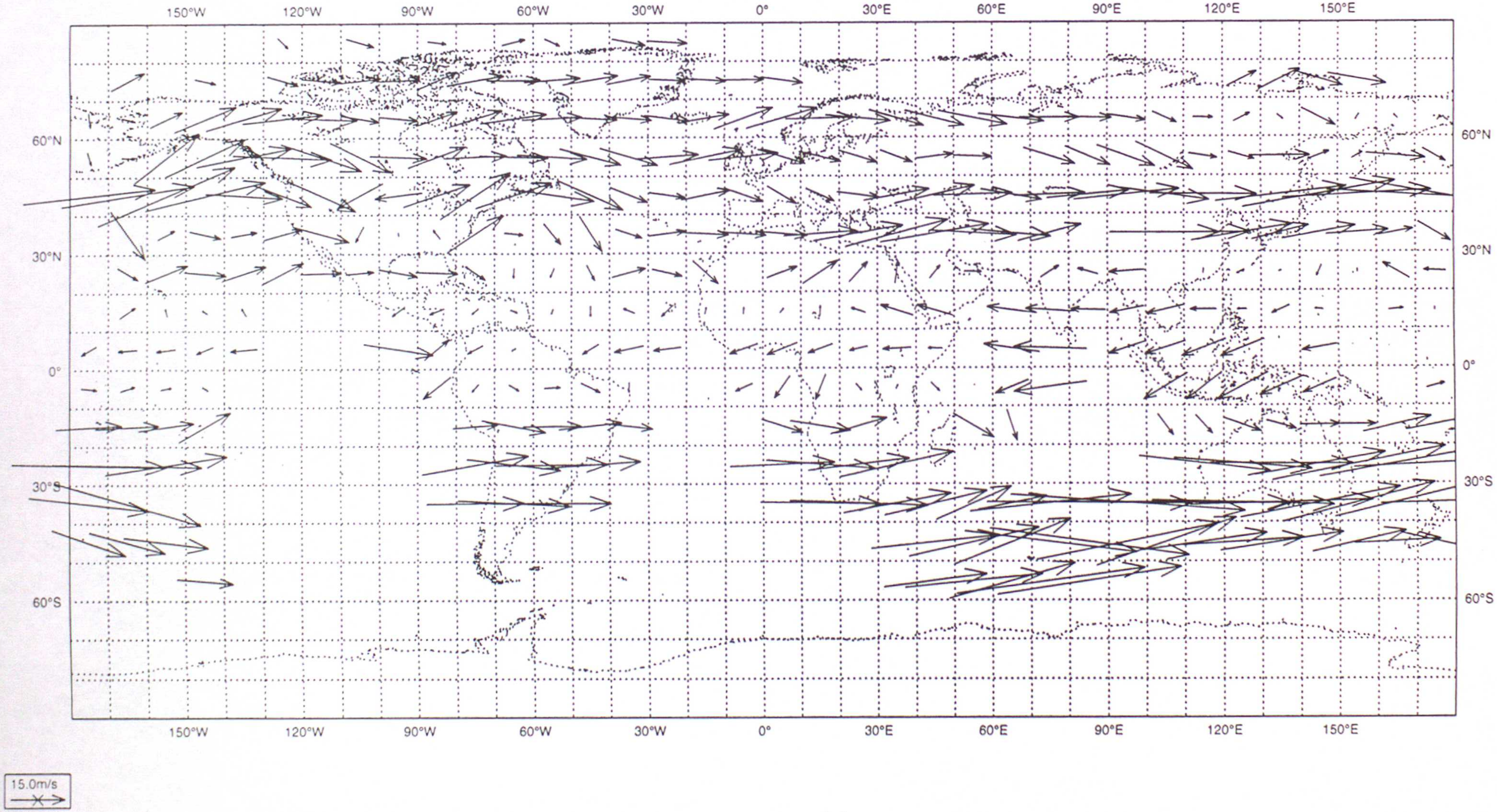

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

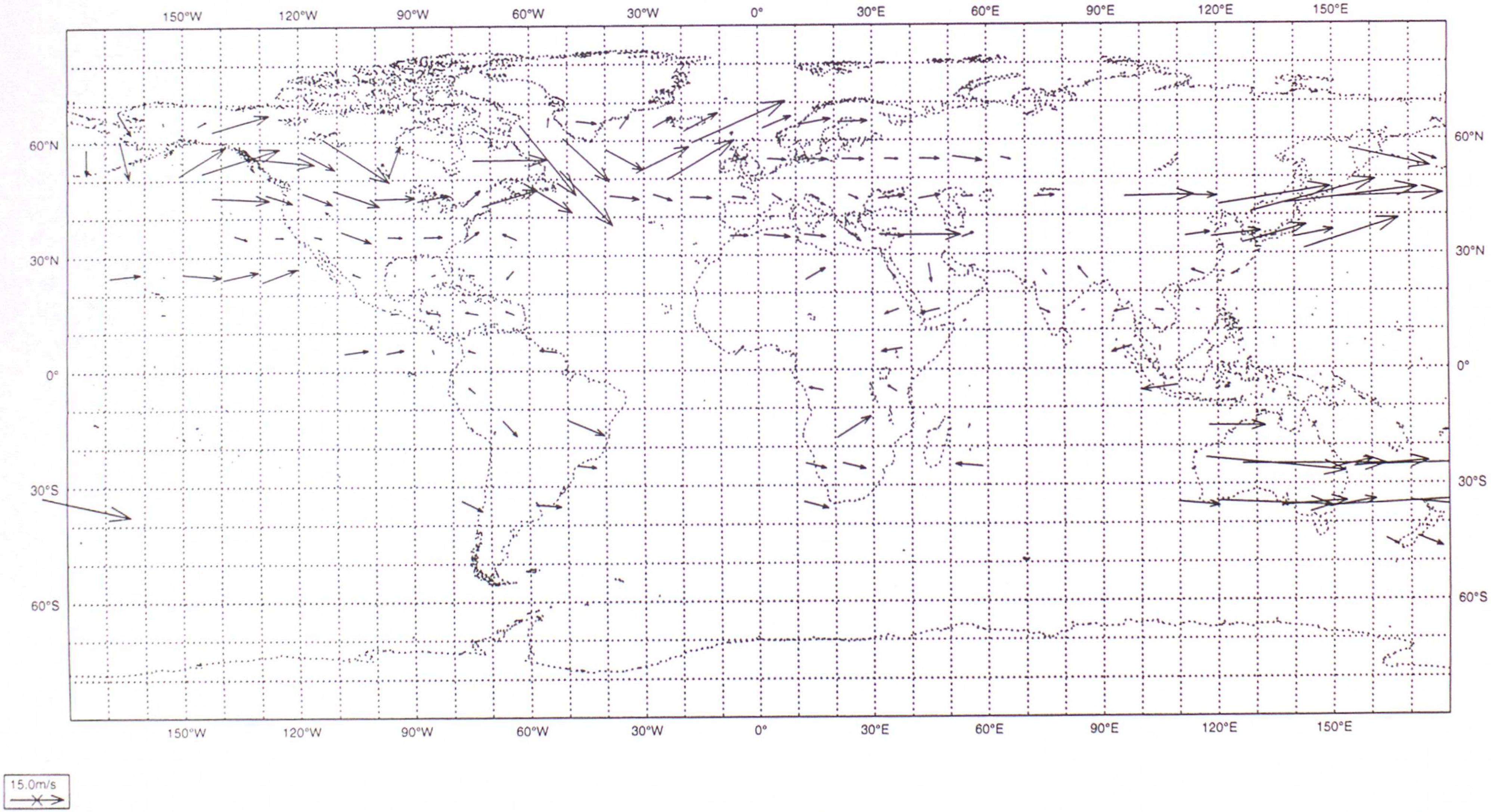

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

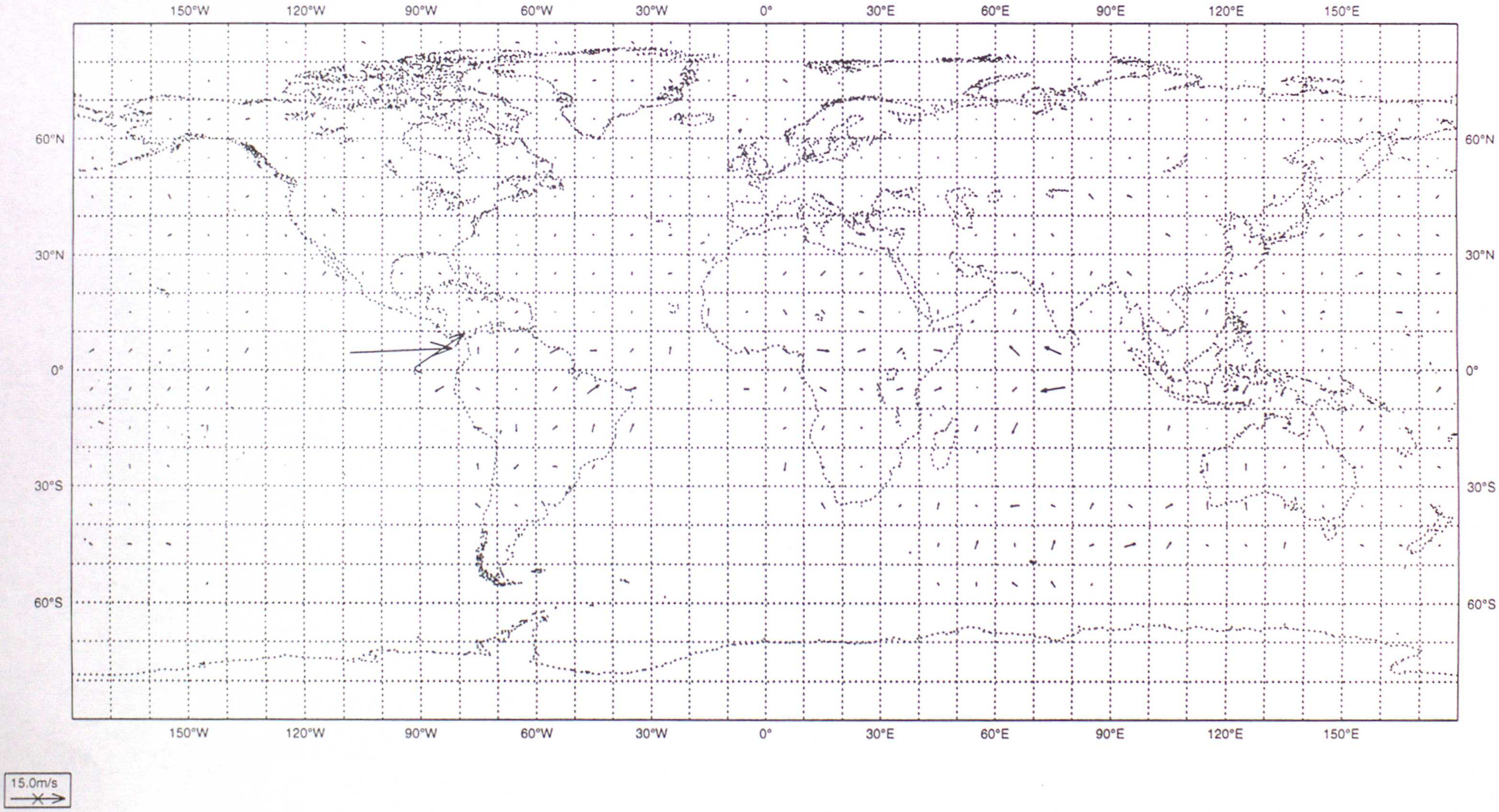

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

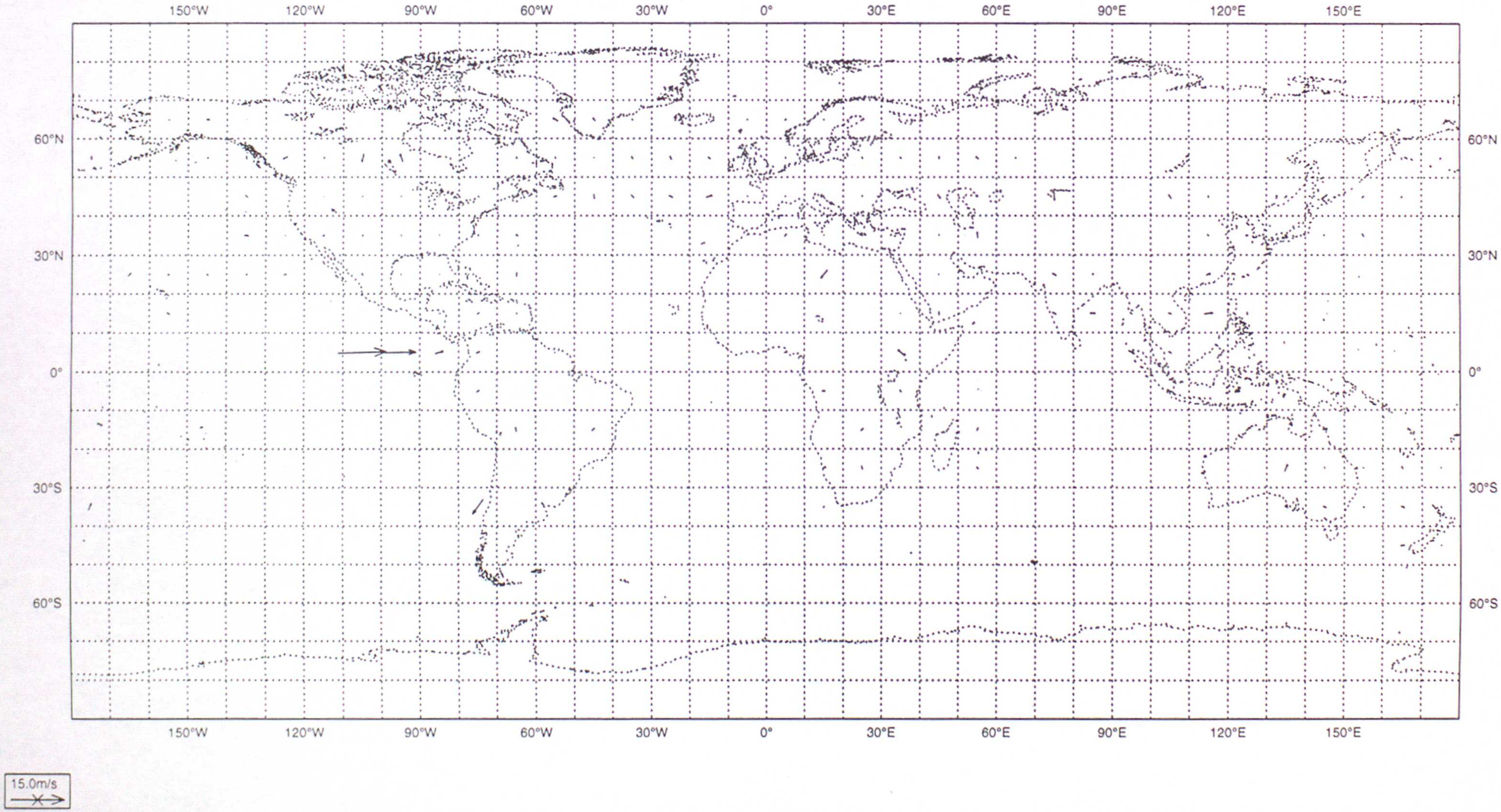

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

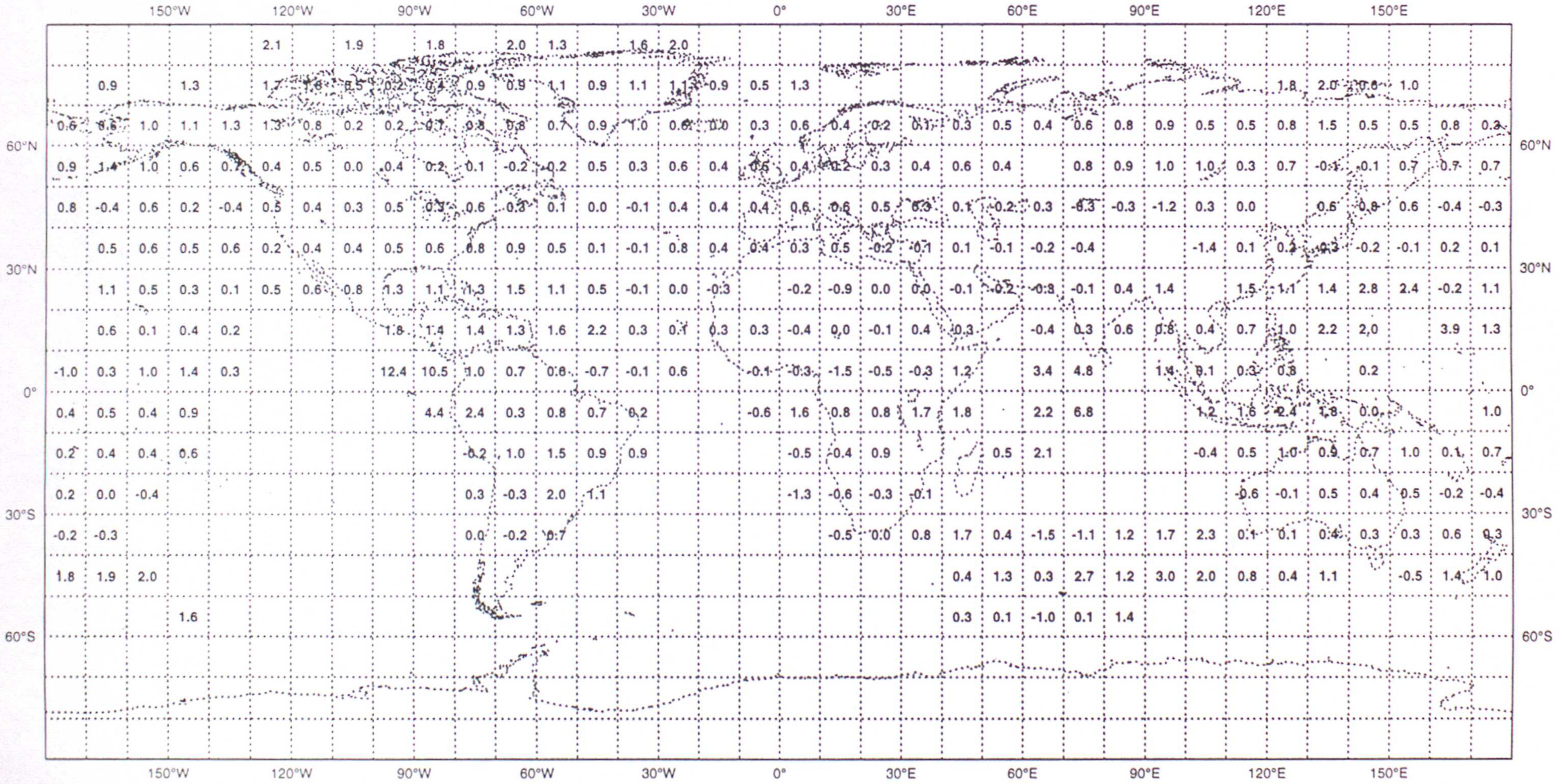

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
2.1 1.9 1.8 2.0 1.3 1.6 2.0
0.9 1.3 1.7 1.8 0.5 0.2 0.4 0.9 0.9 1.1 0.9 1.1 1.1 -0.9 0.5 1.3 1.8 2.0 0.6 1.0
0.6 0.6 1.0 1.1 1.3 1.3 0.8 0.2 0.2 0.7 0.8 0.8 0.7 0.9 1.0 0.6 0.0 0.3 0.6 0.4 0.2 0.1 0.3 0.5 0.4 0.6 0.8 0.9 0.5 0.5 0.8 1.5 0.5 0.5 0.8 0.3
0.9 1.4 1.0 0.6 0.7 0.4 0.5 0.0 0.4 0.2 0.1 -0.2 0.2 0.5 0.3 0.6 0.4 0.5 0.4 0.2 0.3 0.4 0.6 0.4 0.8 0.9 1.0 1.0 0.3 0.7 -0.1 0.1 0.7 0.7 0.7
0.8 -0.4 0.6 0.2 -0.4 0.5 0.4 0.3 0.5 0.3 0.6 0.3 0.1 0.0 -0.1 0.4 0.4 0.4 0.6 0.6 0.5 0.3 0.1 0.2 0.3 0.3 -0.3 -1.2 0.3 0.0 0.6 0.8 0.6 -0.4 -0.3
0.5 0.6 0.5 0.6 0.2 0.4 0.4 0.5 0.6 0.8 0.9 0.5 0.1 -0.1 0.8 0.4 0.4 0.3 0.5 -0.2 -0.1 0.1 -0.1 -0.2 -0.4 -1.4 0.1 0.2 0.3 -0.2 -0.1 0.2 0.1
1.1 0.5 0.3 0.1 0.5 0.6 0.8 1.3 1.1 1.3 1.5 1.1 0.5 -0.1 0.0 -0.3 -0.2 -0.9 0.0 0.0 -0.1 -0.2 -0.3 -0.1 0.4 1.4 1.5 1.1 1.4 2.8 2.4 -0.2 1.1
0.6 0.1 0.4 0.2 1.8 1.4 1.4 1.3 1.6 2.2 0.3 0.1 0.3 0.3 -0.4 0.0 -0.1 0.4 0.3 -0.4 0.3 0.6 0.8 0.4 0.7 1.0 2.2 2.0 3.9 1.3
-1.0 0.3 1.0 1.4 0.3 12.4 10.5 1.0 0.7 0.8 -0.7 -0.1 0.6 -0.1 -0.3 -1.5 -0.5 -0.3 1.2 3.4 4.8 1.4 0.1 0.3 0.8 0.2
0.4 0.5 0.4 0.9 4.4 2.4 0.3 0.8 0.7 0.2 -0.6 1.6 0.8 0.8 1.7 1.8 2.2 6.8 1.2 1.6 2.4 1.8 0.0 1.0
0.2 0.4 0.4 0.6 -0.2 1.0 1.5 0.9 0.9 -0.5 -0.4 0.9 0.5 2.1 -0.4 0.5 1.0 0.9 0.7 1.0 0.1 0.7
0.2 0.0 -0.4 0.3 -0.3 2.0 1.1 -1.3 -0.6 -0.3 0.1 0.6 -0.1 0.5 0.4 0.5 -0.2 -0.4
-0.2 -0.3 0.0 -0.2 0.7 -0.5 0.0 0.8 1.7 0.4 -1.5 -1.1 1.2 1.7 2.3 0.1 0.1 0.4 0.3 0.3 0.6 0.3
1.8 1.9 2.0 0.4 1.3 0.3 2.7 1.2 3.0 2.0 0.8 0.4 1.1 -0.5 1.4 1.0
1.6 0.3 0.1 -1.0 0.1 1.4

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

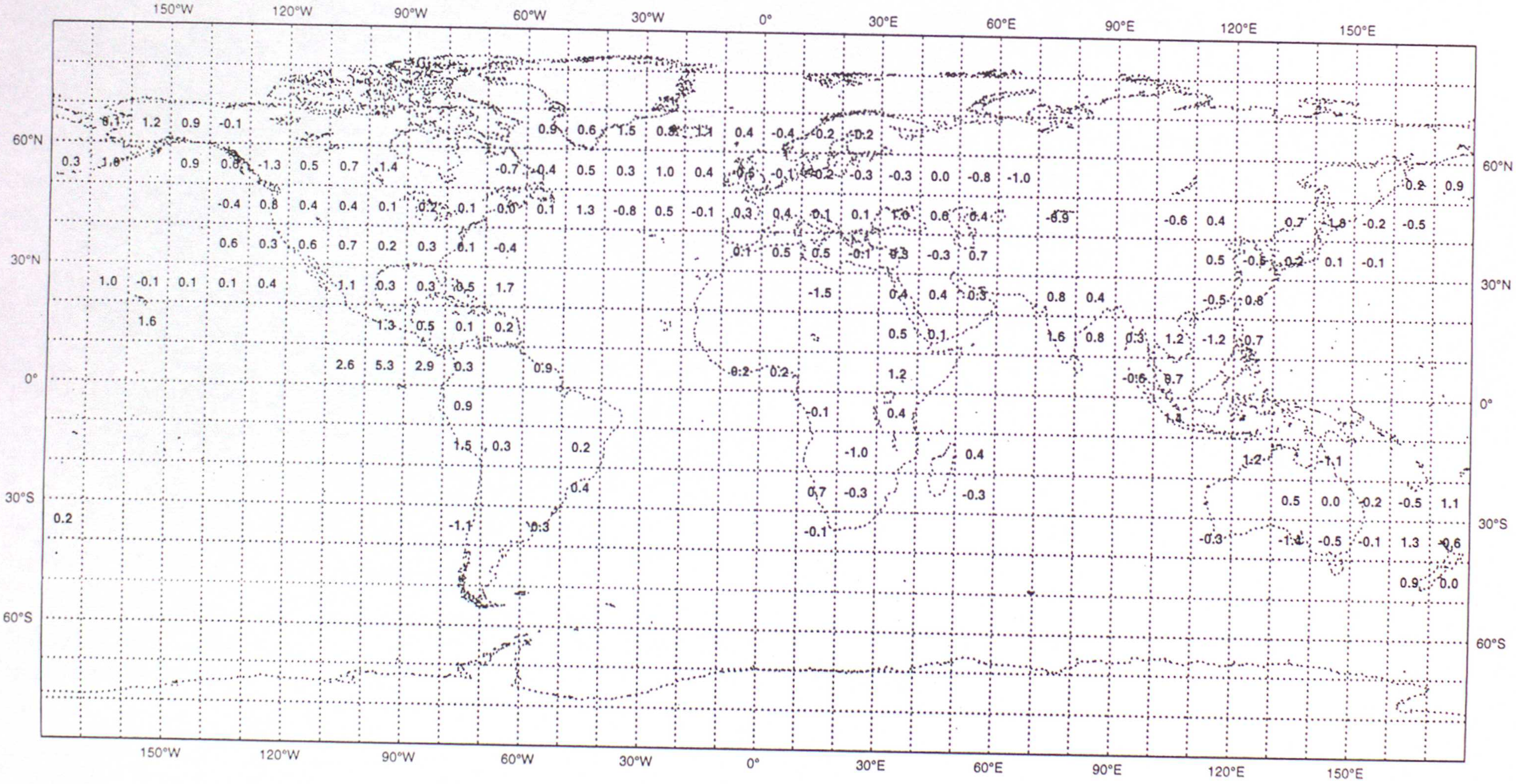

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.1 1.2 0.9 -0.1 0.9 0.6 1.5 0.8 1.1 0.4 -0.4 -0.2 -0.2
0.3 1.8 0.9 0.6 -1.3 0.5 0.7 1.4 -0.7 -0.4 0.5 0.3 1.0 0.4 0.6 -0.1 -0.2 -0.3 -0.3 0.0 -0.8 -1.0 0.2 0.9
-0.4 0.8 0.4 0.4 0.1 0.2 0.1 0.0 0.1 1.3 -0.8 0.5 -0.1 0.3 0.4 0.1 0.1 1.0 0.6 0.4 -0.9 -0.6 0.4 0.7 1.8 -0.2 -0.5
0.6 0.3 0.6 0.7 0.2 0.3 0.1 -0.4 0.1 0.5 0.5 -0.1 0.3 -0.3 0.7 0.5 -0.5 0.2 0.1 -0.1
1.0 -0.1 0.1 0.1 0.4 1.1 0.3 0.3 0.5 1.7 -1.5 0.4 0.4 0.3 0.8 0.4 -0.5 0.8
1.6 1.3 0.5 0.1 0.2 0.5 0.1 1.6 0.8 0.3 1.2 -1.2 0.7
2.6 5.3 2.9 0.3 0.9 0.2 0.2 1.2 -0.6 0.7
0.9 -0.1 0.4 1.4
1.5 0.3 0.2 -1.0 0.4 1.2 1.1
0.4 0.7 -0.3 -0.3 0.5 0.0 0.2 -0.5 1.1
0.2 -1.1 0.3 -0.1 -0.3 -1.4 -0.5 -0.1 1.3 0.6
0.9 0.0

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

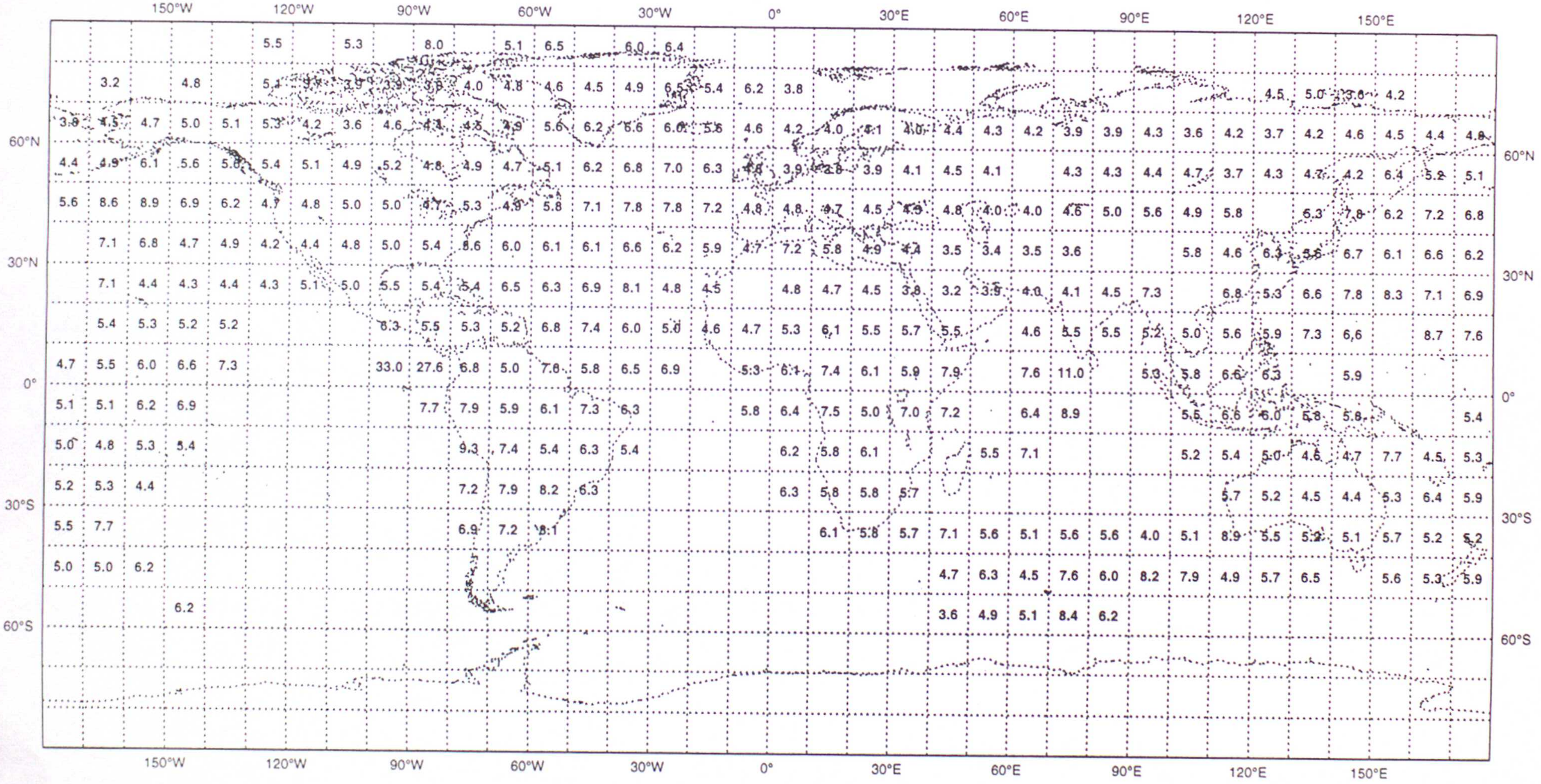

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5.5 5.3 8.0 5.1 6.5 6.0 6.4
3.2 4.8 5.4 3.9 3.9 3.9 3.8 4.0 4.8 4.6 4.5 4.9 6.5 5.4 6.2 3.8 4.5 5.0 3.6 4.2
3.9 4.5 4.7 5.0 5.1 5.3 4.2 3.6 4.6 4.4 4.5 4.9 5.6 6.2 6.6 6.0 5.6 4.6 4.2 4.0 4.1 4.0 4.4 4.3 4.2 3.9 3.9 4.3 3.6 4.2 3.7 4.2 4.6 4.5 4.4 4.8
4.4 4.9 6.1 5.6 5.6 5.4 5.1 4.9 5.2 4.8 4.9 4.7 5.1 6.2 6.8 7.0 6.3 4.8 3.9 2.8 3.9 4.1 4.5 4.1 4.3 4.3 4.4 4.7 3.7 4.3 4.7 4.2 6.4 5.2 5.1
5.6 8.6 8.9 6.9 6.2 4.7 4.8 5.0 5.0 4.7 5.3 4.9 5.8 7.1 7.8 7.8 7.2 4.8 4.8 4.7 4.5 4.9 4.8 4.0 4.0 4.6 5.0 5.6 4.9 5.8 5.3 7.8 6.2 7.2 6.8
7.1 6.8 4.7 4.9 4.2 4.4 4.8 5.0 5.4 5.6 6.0 6.1 6.1 6.6 6.2 5.9 4.7 7.2 5.8 4.9 4.4 3.5 3.4 3.5 3.6 5.8 4.6 6.3 5.6 6.7 6.1 6.6 6.2
7.1 4.4 4.3 4.4 4.3 5.1 5.0 5.5 5.4 5.4 6.5 6.3 6.9 8.1 4.8 4.5 4.8 4.7 4.5 3.8 3.2 3.5 4.0 4.1 4.5 7.3 6.8 5.3 6.6 7.8 8.3 7.1 6.9
5.4 5.3 5.2 5.2 6.3 5.5 5.3 5.2 6.8 7.4 6.0 5.0 4.6 4.7 5.3 6.1 5.5 5.7 5.5 4.6 5.5 5.5 5.2 5.0 5.6 5.9 7.3 6.6 8.7 7.6
4.7 5.5 6.0 6.6 7.3 33.0 27.6 6.8 5.0 7.8 5.8 6.5 6.9 5.3 6.1 7.4 6.1 5.9 7.9 7.6 11.0 5.3 5.8 6.6 6.3 5.9
5.1 5.1 6.2 6.9 7.7 7.9 5.9 6.1 7.3 6.3 5.8 6.4 7.5 5.0 7.0 7.2 6.4 8.9 5.5 6.6 6.0 5.8 5.8 5.4
5.0 4.8 5.3 5.4 9.3 7.4 5.4 6.3 5.4 6.2 5.8 6.1 5.5 7.1 5.2 5.4 5.0 4.6 4.7 7.7 4.5 5.3
5.2 5.3 4.4 7.2 7.9 8.2 6.3 6.3 5.8 5.8 5.7 5.7 5.2 4.5 4.4 5.3 6.4 5.9
5.5 7.7 6.9 7.2 8.1 6.1 5.8 5.7 7.1 5.6 5.1 5.6 5.6 4.0 5.1 8.9 5.5 5.2 5.1 5.7 5.2 5.2
5.0 5.0 6.2 4.7 6.3 4.5 7.6 6.0 8.2 7.9 4.9 5.7 6.5 5.6 5.3 5.9
6.2 3.6 4.9 5.1 8.4 6.2

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). SEPTEMBER 2003
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

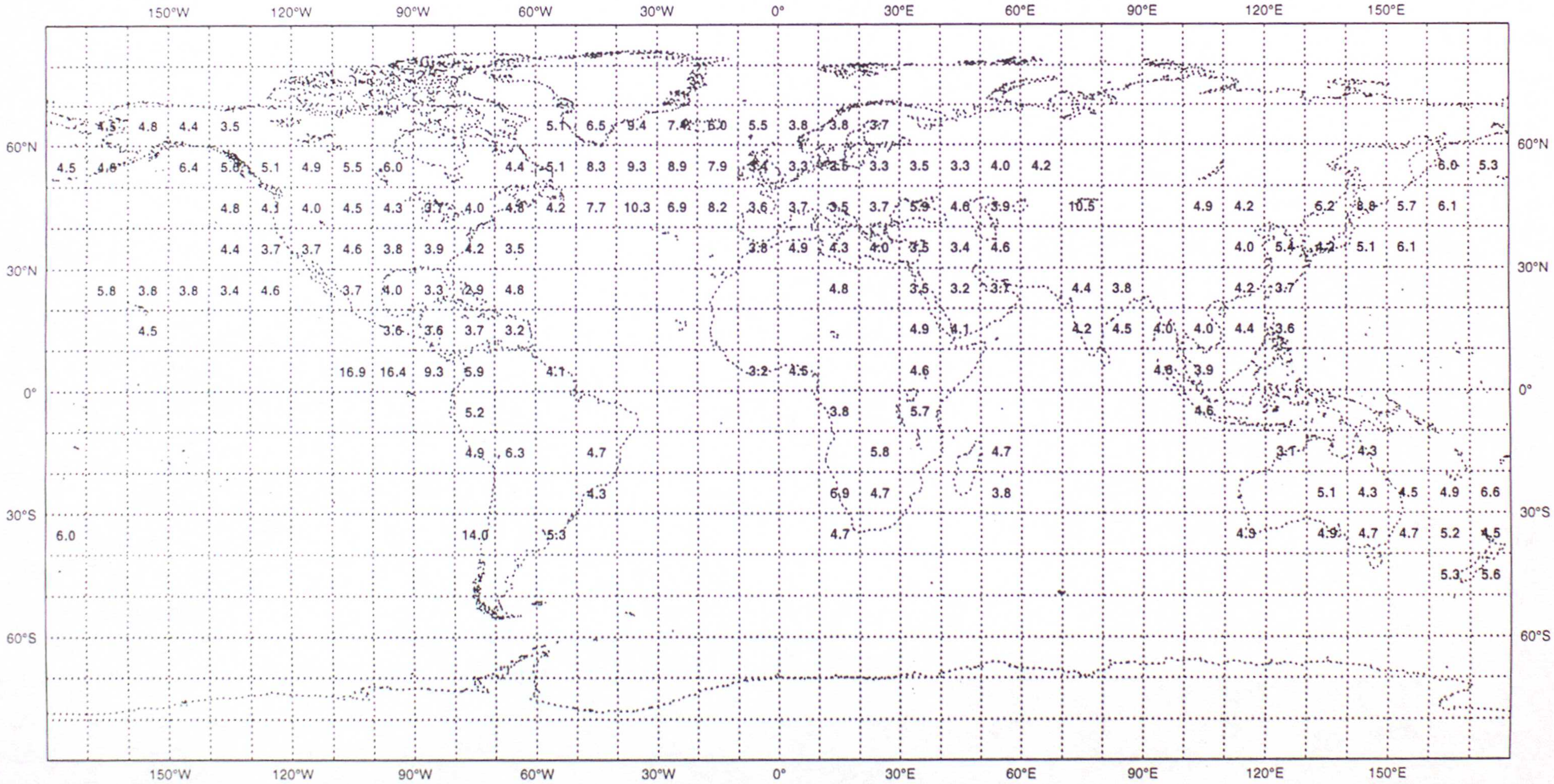

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.5 4.8 4.4 3.5 5.1 6.5 9.4 7.4 6.0 5.5 3.8 3.8 3.7
4.5 4.6 6.4 5.6 5.1 4.9 5.5 6.0 4.4 5.1 8.3 9.3 8.9 7.9 3.4 3.3 2.5 3.3 3.5 3.3 4.0 4.2 6.0 5.3
4.8 4.3 4.0 4.5 4.3 3.7 4.0 4.8 4.2 7.7 10.3 6.9 8.2 3.6 3.7 3.5 3.7 5.9 4.6 3.9 10.5 4.9 4.2 6.2 8.8 5.7 6.1
4.4 3.7 3.7 4.6 3.8 3.9 4.2 3.5 3.8 4.9 4.3 4.0 3.5 3.4 4.6 4.0 5.4 4.2 5.1 6.1
5.8 3.8 3.8 3.4 4.6 3.7 4.0 3.3 2.9 4.8 4.8 3.5 3.2 3.7 4.4 3.8 4.2 3.7
4.5 3.6 3.6 3.7 3.2 4.9 4.1 4.2 4.5 4.0 4.0 4.4 3.6
16.9 16.4 9.3 5.9 4.1 3.2 4.5 4.6 4.6 3.9
5.2 3.8 5.7 4.6
4.9 6.3 4.7 5.8 4.7 3.1 4.3
4.3 6.9 4.7 3.8 5.1 4.3 4.5 4.9 6.6
6.0 14.0 5.3 4.7 4.9 4.9 4.7 4.7 5.2 4.5
5.3 5.6

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	
	ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS	

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	50	73/ 80	13	4	100.0	212.2	234.5	8
20744	00	Z	1000	72/ 53	15	6	36.4	-30.2	47.3	6
34247	12	Z	50	50/ 41	24	0	100.5	149.2	179.9	4
42101	00	Z	100	30/ 76	13	0	126.6	1.8	126.6	4
42101	12	Z	70	30/ 76	15	0	130.9	180.3	222.8	6
42182	00	Z	300	29/ 77	21	0	83.8	-49.2	97.2	7
42182	12	Z	500	29/ 77	25	0	33.0	-50.2	60.0	7
42339	12	Z	100	26/ 73	10	0	131.3	-56.5	143.0	4
42361	00	Z	150	26/ 78	20	2	130.8	-69.1	147.9	8
42361	12	Z	200	26/ 78	13	0	66.5	-112.5	130.7	7
42369	12	Z	1000	27/ 81	6	8	1.0	-96.0	96.0	5
42410	00	Z	70	26/ 92	11	0	117.2	65.9	134.5	4
42492	00	Z	1000	26/ 85	26	0	25.9	-50.5	56.8	4
42647	00	Z	200	23/ 73	17	0	96.7	-85.9	129.4	6
42701	12	Z	150	23/ 85	13	0	80.0	-109.3	135.5	6
42724	12	Z	200	24/ 91	11	0	64.1	-82.5	104.5	5
42809	00	Z	150	23/ 88	27	0	95.3	-138.6	168.2	5
42809	12	Z	150	23/ 88	19	6	116.7	-146.1	187.0	7
42867	00	Z	200	21/ 79	19	0	110.0	-31.8	114.5	6
42867	12	Z	70	21/ 79	11	0	134.4	132.8	188.9	6
42971	00	Z	1000	20/ 86	25	0	25.2	-33.6	42.0	5
43003	00	Z	1000	19/ 73	26	3	9.2	-87.4	87.9	6
43003	12	Z	1000	19/ 73	19	8	6.9	-89.1	89.3	10
43014	00	Z	400	20/ 75	14	0	50.9	51.5	72.4	5
43014	12	Z	200	20/ 75	10	0	110.3	33.2	115.1	6
43150	00	Z	200	18/ 83	29	0	57.3	-72.8	92.6	5
43150	12	Z	200	18/ 83	27	0	53.8	-75.2	92.5	7
43185	00	Z	50	16/ 81	15	0	78.1	164.0	181.7	9
43185	12	Z	70	16/ 81	9	1	111.2	145.1	182.8	5
43192	00	Z	200	15/ 74	18	1	98.4	-121.3	156.2	8
43192	12	Z	150	15/ 74	13	1	101.1	-64.8	120.1	6
43295	00	Z	850	13/ 78	21	1	33.7	22.0	40.3	4
43295	12	Z	850	13/ 78	18	1	32.2	37.6	49.5	8
43311	12	Z	150	11/ 73	11	0	91.8	82.4	123.3	4
43353	00	Z	1000	10/ 76	19	0	21.5	-74.3	77.3	4
43369	12	Z	400	8/ 73	19	0	44.2	86.2	96.8	6
43371	00	Z	150	8/ 77	20	0	97.6	-62.3	115.8	6
58968	00	Z	1000	25/ 122	19	10	9.4	-83.3	83.8	5
61902	12	Z	1000	-8/ -14	21	0	27.8	54.4	61.1	9
78866	12	Z	850	18/ -63	29	0	12.4	32.3	34.6	5
89592	00	Z	50	-67/ 93	16	3	96.0	211.7	232.4	7
96935	00	Z	1000	-7/ 113	12	0	9.6	-68.9	69.6	5
97180	00	Z	250	-5/ 120	12	0	55.3	-110.4	123.5	7
97560	00	Z	150	-1/ 136	11	0	89.2	-36.5	96.4	6

Figure 8. TEMP 500 hPa geopotential mean daily count. SEPTEMBER 2003
All hours
Global average number of observations in 24 hours = 1171

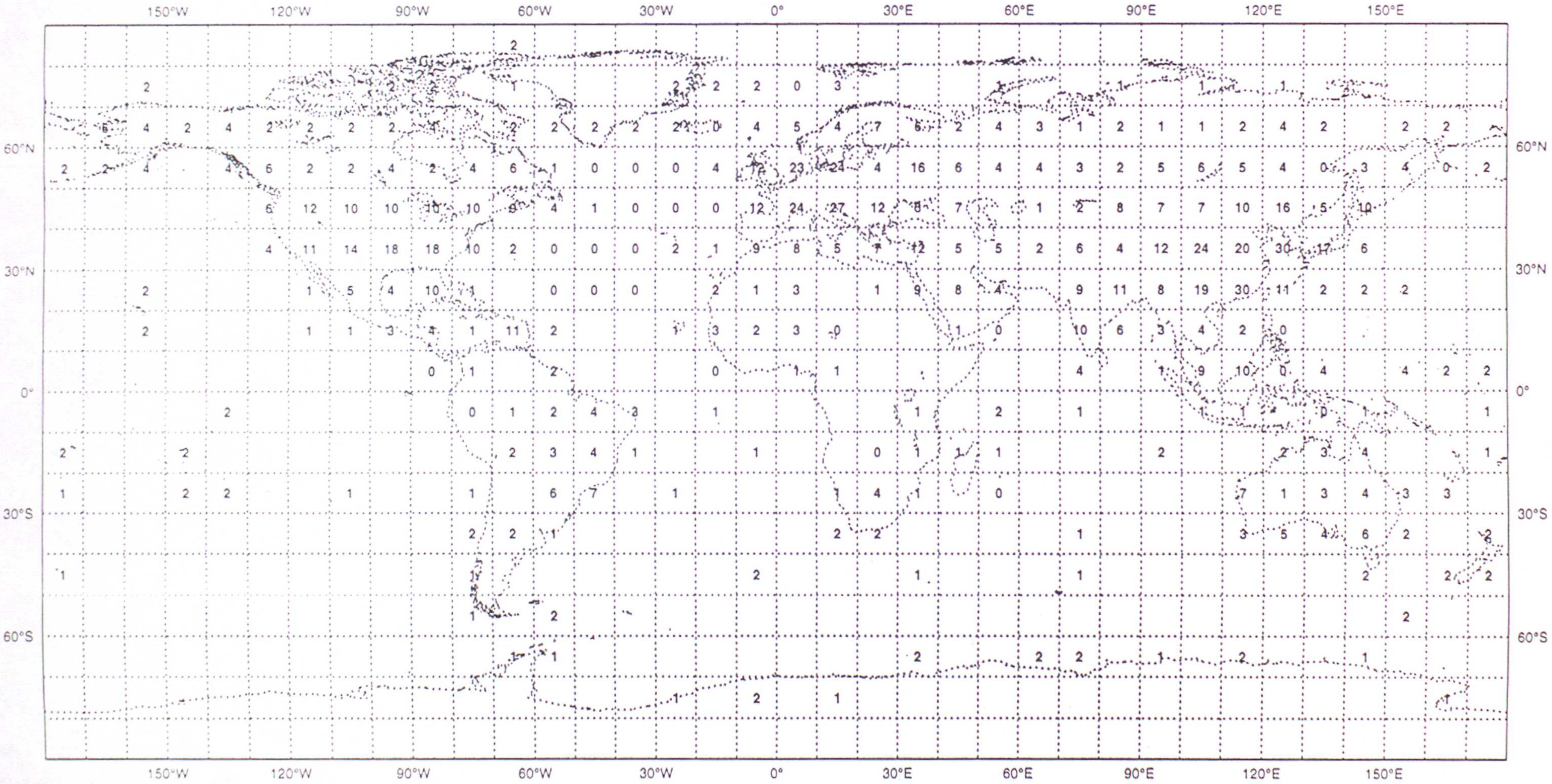

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
10954	12	V	300	48/ 11	12	0	8	0.1	2.6	15.0	1
16754	00	V	150	35/ 25	20	1	5	-6.0	1.1	23.2	1
31977	12	V	100	43/ 132	15	0	20	13.0	-0.5	16.6	1
48601	12	V	100	5/ 100	30	0	100	9.8	1.9	15.7	1
60360	12	V	100	37/ 8	10	0	100	9.3	0.4	16.3	2
68442	12	V	200	-29/ 26	11	0	100	-22.8	-0.4	26.7	4
68512	12	V	250	-30/ 18	18	0	100	-14.3	-0.4	21.5	4
68842	12	V	300	-34/ 26	11	0	18	-12.1	0.0	16.3	1
85586	00	V	250	-34/ -72	23	0	8	0.6	-4.1	21.7	1
96749	00	V	300	-6/ 107	25	0	8	1.9	-1.0	15.4	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. SEPTEMBER 2003
All hours
Global average number of observations in 24 hours = 1369

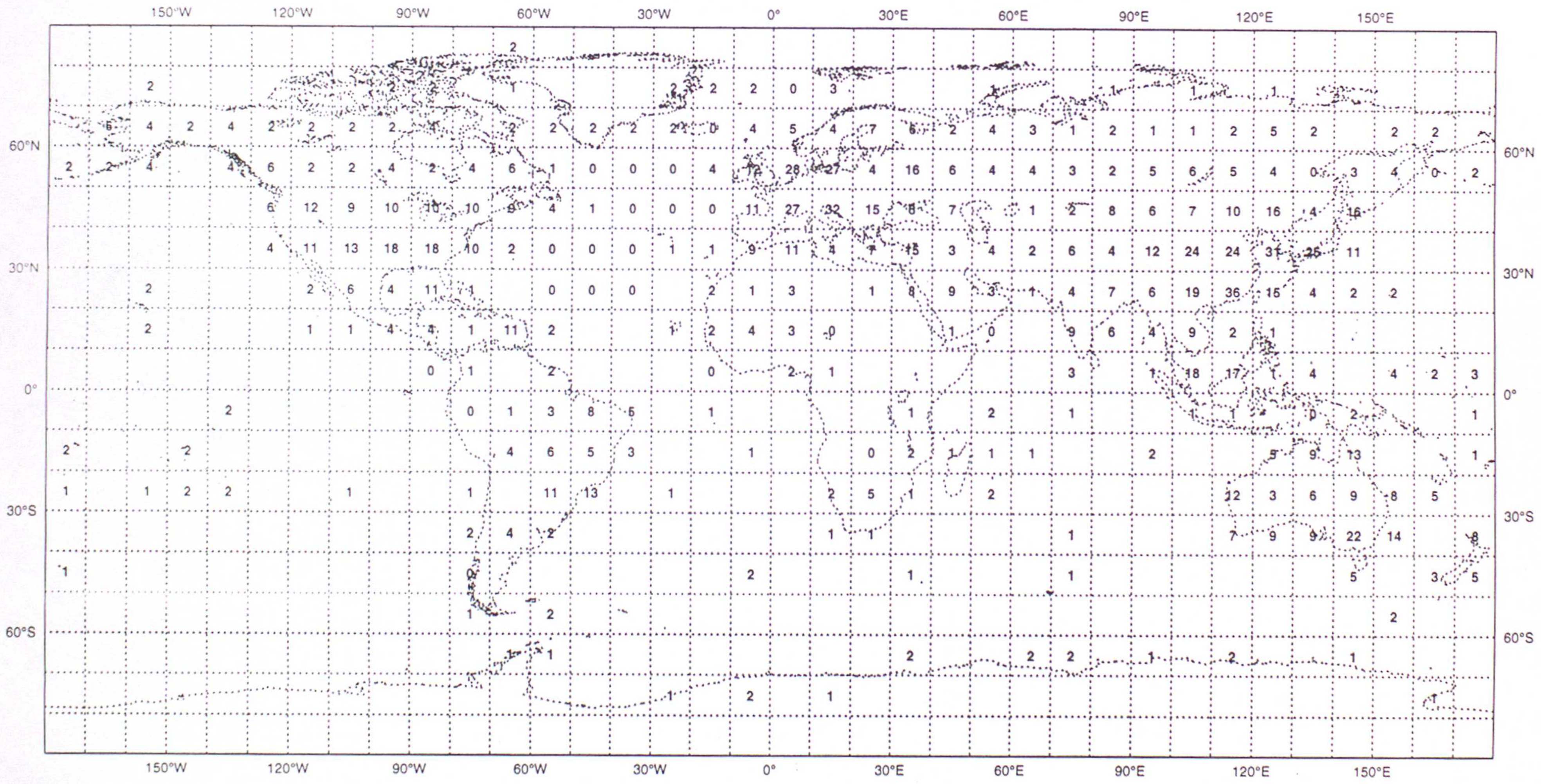

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 2 0 3 1 1 1 1
6 4 2 4 2 2 2 2 2 2 2 2 2 0 4 5 4 7 6 2 4 3 1 2 1 1 2 5 2 2 2
2 2 4 4 6 2 2 4 2 4 6 1 0 0 0 4 12 28 27 4 16 6 4 4 3 2 5 6 5 4 0 3 4 0 2
6 12 9 10 10 10 9 4 1 0 0 0 11 27 32 15 8 7 1 2 8 6 7 10 16 4 16
4 11 13 18 18 10 2 0 0 0 1 1 9 11 4 7 15 3 4 2 6 4 12 24 24 31 25 11
2 2 6 4 11 1 0 0 0 2 1 3 1 8 9 3 1 4 7 6 19 36 15 4 2 2
2 1 1 4 4 1 11 2 1 2 4 3 0 1 0 9 6 4 9 2 1
0 1 2 0 2 1 3 1 18 17 1 4 4 2 3
2 0 1 3 8 5 1 1 2 1 1 1 2 1
2 2 4 6 5 3 1 0 2 1 1 1 2 5 9 13 1
1 1 2 2 1 1 11 13 1 2 5 1 2 12 3 6 9 8 5
2 4 2 1 1 1 7 9 9 22 14 8
1 0 2 1 1 5 3 5
1 2 2
1 1 2 2 2 1 2 1
1 2 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
42809	00	DD	23/ 88	19	10.6	9.3	20.4
48855	12	DD	16/ 108	5	15.5	8.8	26.7
62337	00	DD	31/ 34	26	-20.1	3.5	8.1
78397	12	DD	18/ -77	6	16.5	7.7	19.1

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: Sep 03

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. SEPTEMBER 2003
Global average number of observations in 24 hours = 77224

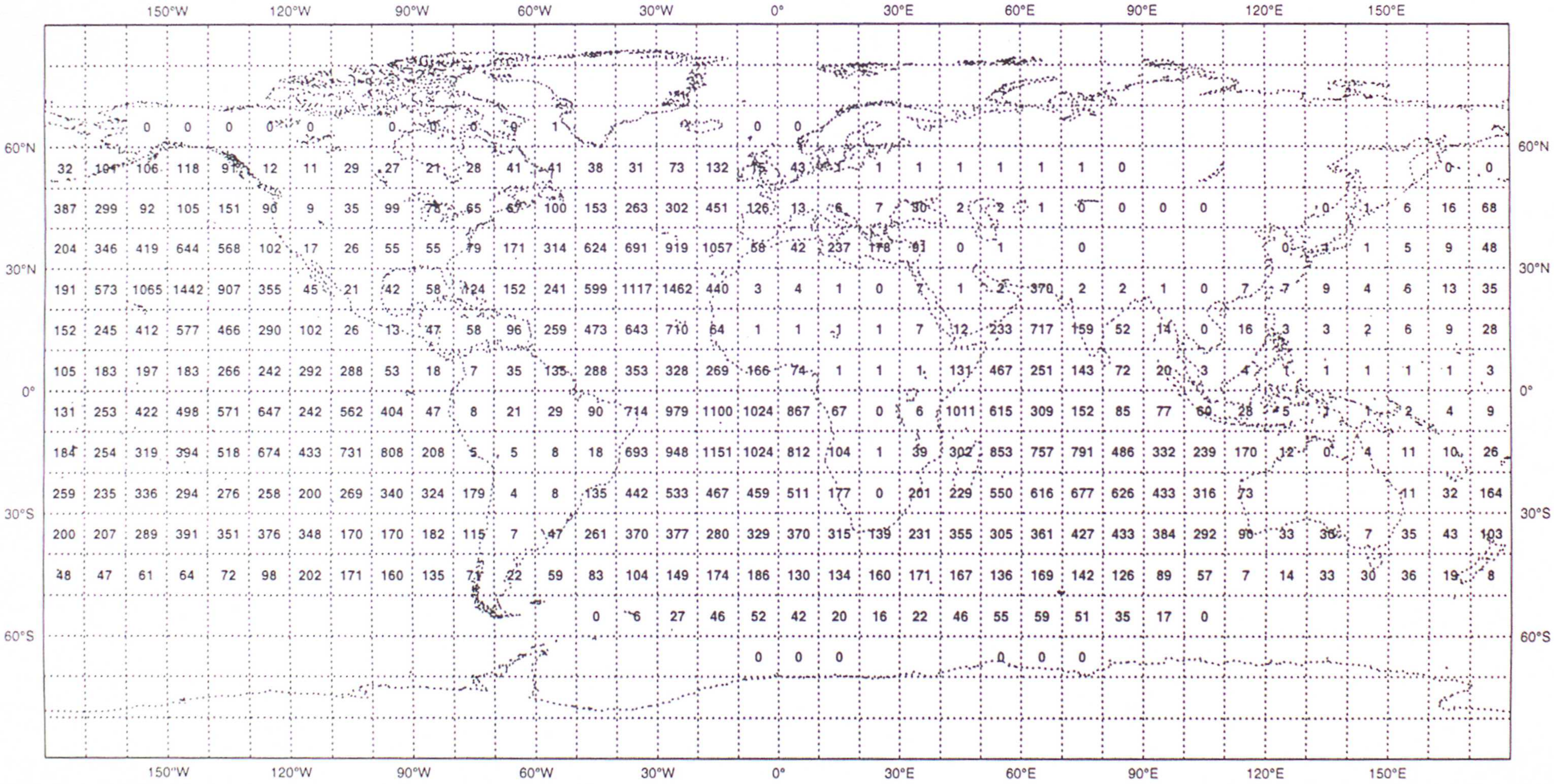

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0 0 1 0 0
32 104 106 118 91 12 11 29 27 21 28 41 41 38 31 73 132 75 43 1 1 1 1 1 1 1 0 0 0
387 299 92 105 151 90 9 35 99 78 65 67 100 153 263 302 451 126 13 6 7 30 2 2 1 0 0 0 0 0 1 6 16 68
204 346 419 644 568 102 17 26 55 55 79 171 314 624 691 919 1057 58 42 237 178 81 0 1 0 0 1 1 5 9 48
191 573 1065 1442 907 355 45 21 42 58 124 152 241 599 1117 1462 440 3 4 1 0 7 1 2 370 2 2 1 0 7 7 9 4 6 13 35
152 245 412 577 466 290 102 26 13 47 58 96 259 473 643 710 64 1 1 1 1 7 12 233 717 159 52 14 0 16 3 3 2 6 9 28
105 183 197 183 266 242 292 288 53 18 7 35 135 288 353 328 269 166 74 1 1 1 131 467 251 143 72 20 3 4 1 1 1 1 1 3
131 253 422 498 571 647 242 562 404 47 8 21 29 90 714 979 1100 1024 867 67 0 6 1011 615 309 152 85 77 60 28 5 1 1 2 4 9
184 254 319 394 518 674 433 731 808 208 5 5 8 18 693 948 1151 1024 812 104 1 39 302 853 757 791 486 332 239 170 12 0 4 11 10 26
259 235 336 294 276 258 200 269 340 324 179 4 8 135 442 533 467 459 511 177 0 201 229 550 616 677 626 433 316 73 11 32 164
200 207 289 391 351 376 348 170 170 182 115 7 47 261 370 377 280 329 370 315 139 231 355 305 361 427 433 384 292 90 33 36 7 35 43 103
48 47 61 64 72 98 202 171 160 135 71 22 59 83 104 149 174 186 130 134 160 171 167 136 169 142 126 89 57 7 14 33 30 36 19 8
0 6 27 46 52 42 20 16 22 46 55 59 51 35 17 0
0 0 0 0 0 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

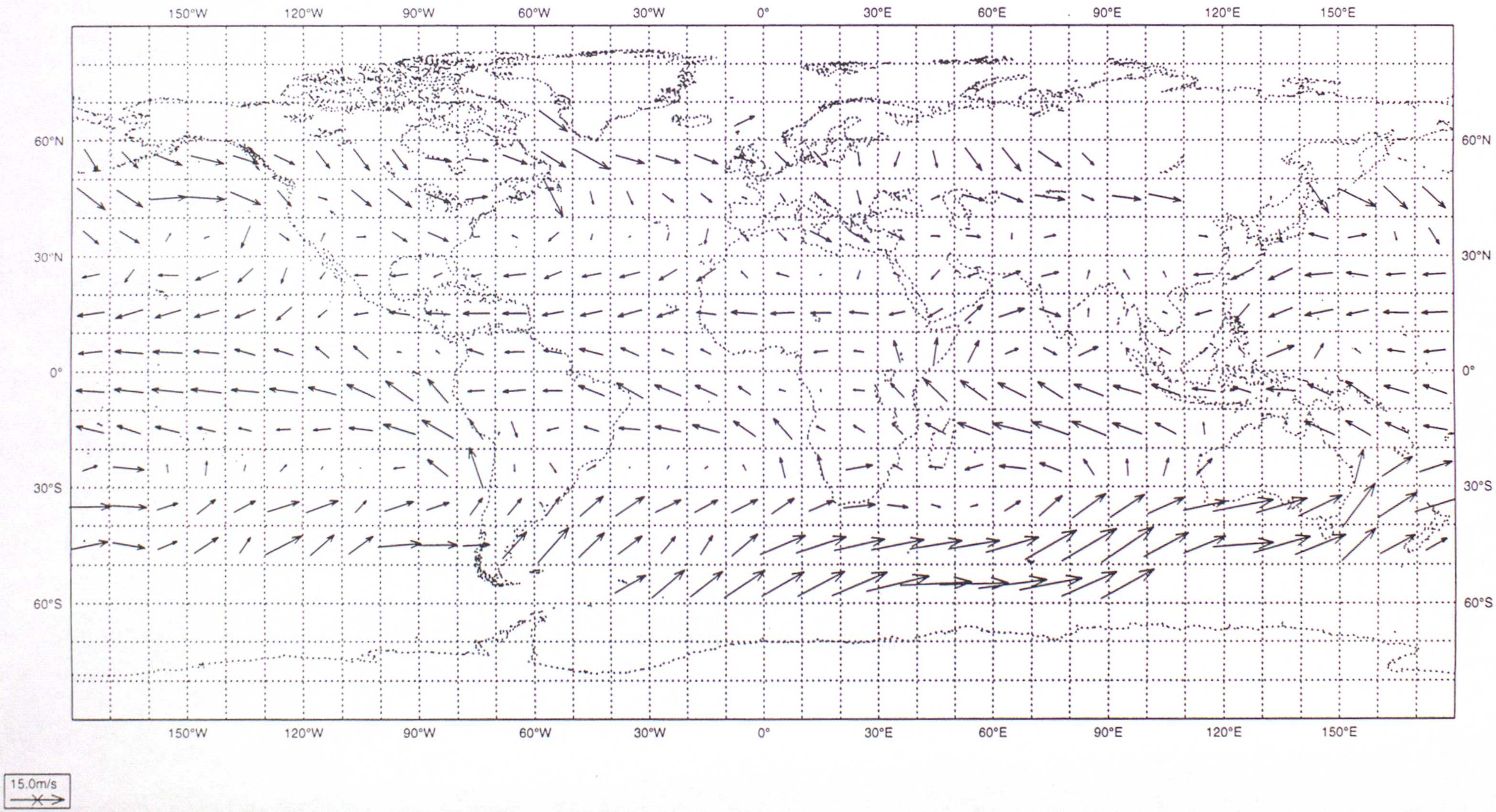

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

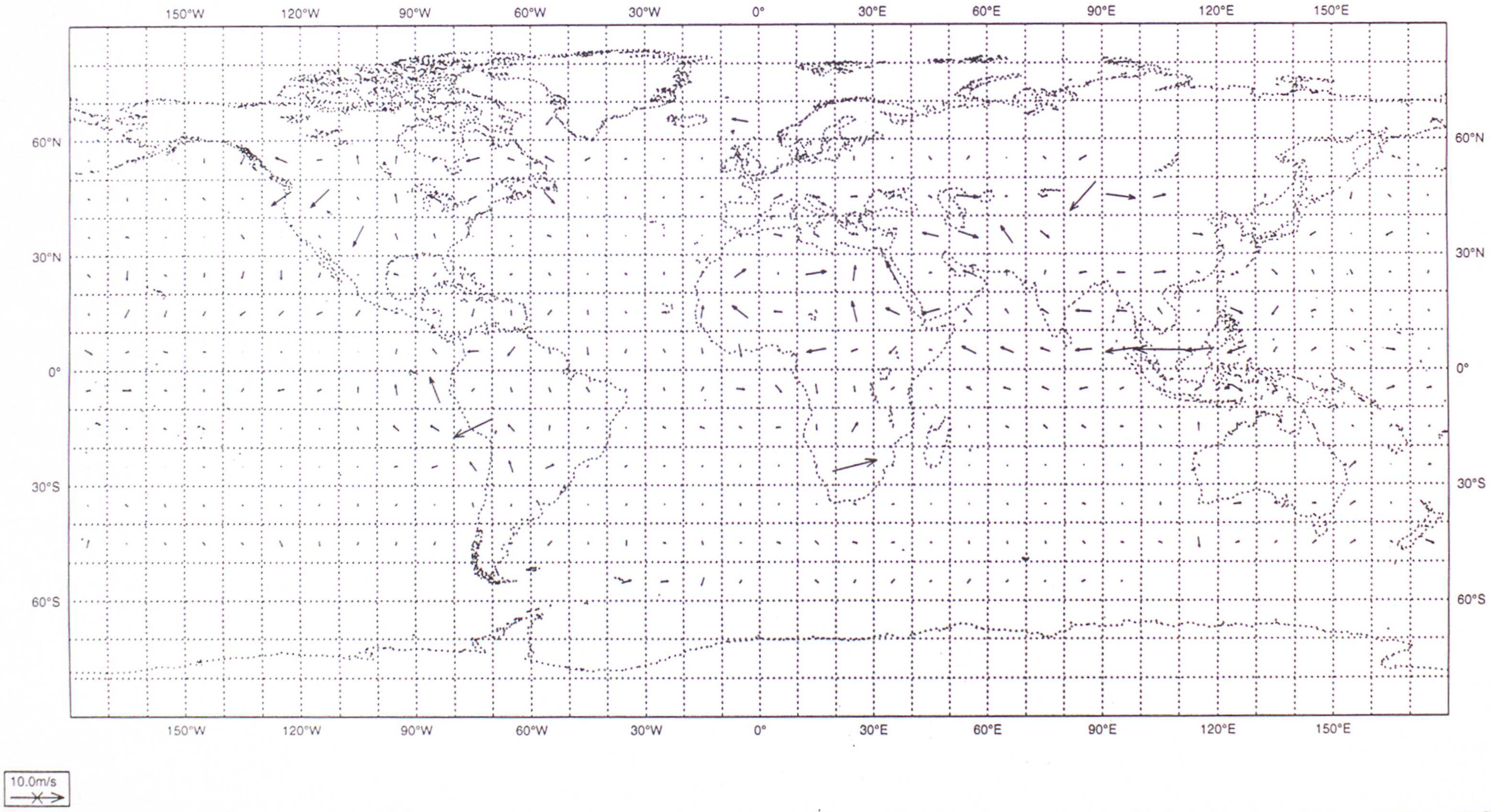

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

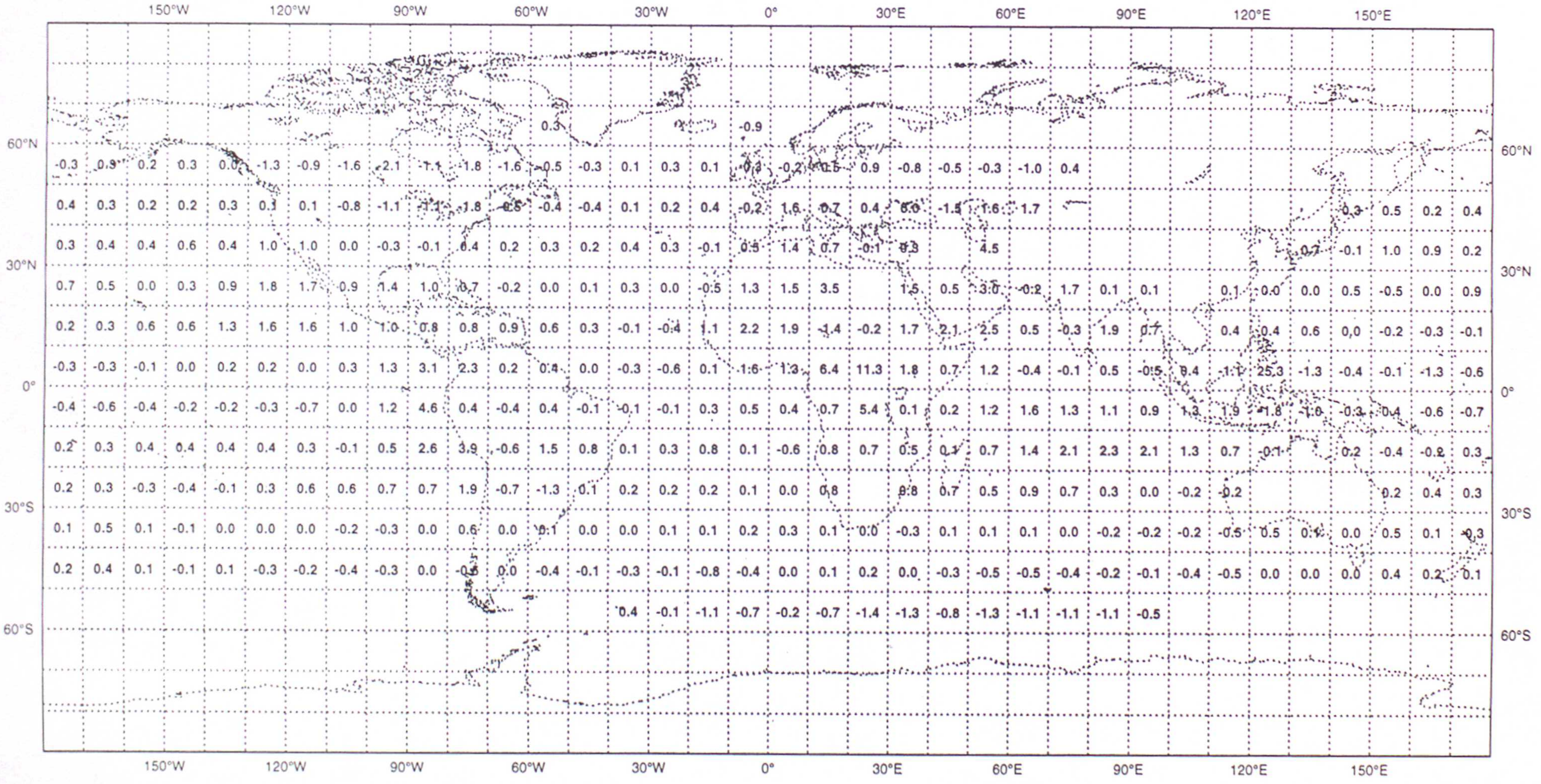

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.3 -0.9
-0.3 0.9 0.2 0.3 0.0 -1.3 -0.9 -1.6 -2.1 -1.1 -1.8 -1.6 -0.5 -0.3 0.1 0.3 0.1 0.3 -0.2 -0.5 0.9 -0.8 -0.5 -0.3 -1.0 0.4
0.4 0.3 0.2 0.2 0.3 0.1 0.1 -0.8 -1.1 -1.1 -1.8 -0.5 -0.4 -0.4 0.1 0.2 0.4 -0.2 1.6 0.7 0.4 6.0 -1.5 1.6 1.7 0.3 0.5 0.2 0.4
0.3 0.4 0.4 0.6 0.4 1.0 1.0 0.0 -0.3 -0.1 0.4 0.2 0.3 0.2 0.4 0.3 -0.1 0.5 1.4 0.7 -0.1 0.3 4.5 0.7 -0.1 1.0 0.9 0.2
0.7 0.5 0.0 0.3 0.9 1.8 1.7 -0.9 1.4 1.0 0.7 -0.2 0.0 0.1 0.3 0.0 -0.5 1.3 1.5 3.5 1.5 0.5 3.0 -0.2 1.7 0.1 0.1 0.1 0.0 0.0 0.5 -0.5 0.0 0.9
0.2 0.3 0.6 0.6 1.3 1.6 1.6 1.0 1.0 0.8 0.8 0.9 0.6 0.3 -0.1 -0.4 1.1 2.2 1.9 -1.4 -0.2 1.7 2.1 2.5 0.5 -0.3 1.9 0.7 0.4 0.4 0.6 0.0 -0.2 -0.3 -0.1
-0.3 -0.3 -0.1 0.0 0.2 0.2 0.0 0.3 1.3 3.1 2.3 0.2 0.4 0.0 -0.3 -0.6 0.1 -1.6 1.3 6.4 11.3 1.8 0.7 1.2 -0.4 -0.1 0.5 -0.5 0.4 -1.1 25.3 -1.3 -0.4 -0.1 -1.3 -0.6
-0.4 -0.6 -0.4 -0.2 -0.2 -0.3 -0.7 0.0 1.2 4.6 0.4 -0.4 0.4 -0.1 -0.1 -0.1 0.3 0.5 0.4 0.7 5.4 0.1 0.2 1.2 1.6 1.3 1.1 0.9 1.3 1.9 -1.8 -1.0 -0.3 -0.4 -0.6 -0.7
0.2 0.3 0.4 0.4 0.4 0.4 0.3 -0.1 0.5 2.6 3.9 -0.6 1.5 0.8 0.1 0.3 0.8 0.1 -0.6 0.8 0.7 0.5 0.1 0.7 1.4 2.1 2.3 2.1 1.3 0.7 -0.1 0.2 -0.4 -0.2 0.3
0.2 0.3 -0.3 -0.4 -0.1 0.3 0.6 0.6 0.7 0.7 1.9 -0.7 -1.3 0.1 0.2 0.2 0.2 0.1 0.0 0.8 0.8 0.7 0.5 0.9 0.7 0.3 0.0 -0.2 -0.2 0.2 0.4 0.3
0.1 0.5 0.1 -0.1 0.0 0.0 0.0 -0.2 -0.3 0.0 0.6 0.0 0.1 0.0 0.0 0.1 0.1 0.2 0.3 0.1 0.0 -0.3 0.1 0.1 0.1 0.0 -0.2 -0.2 -0.2 -0.5 0.5 0.1 0.0 0.5 0.1 -0.3
0.2 0.4 0.1 -0.1 0.1 -0.3 -0.2 -0.4 -0.3 0.0 -0.5 0.0 -0.4 -0.1 -0.3 -0.1 -0.8 -0.4 0.0 0.1 0.2 0.0 -0.3 -0.5 -0.5 -0.4 -0.2 -0.1 -0.4 -0.5 0.0 0.0 0.0 0.4 0.2 0.1
0.4 -0.1 -1.1 -0.7 -0.2 -0.7 -1.4 -1.3 -0.8 -1.3 -1.1 -1.1 -1.1 -0.5

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

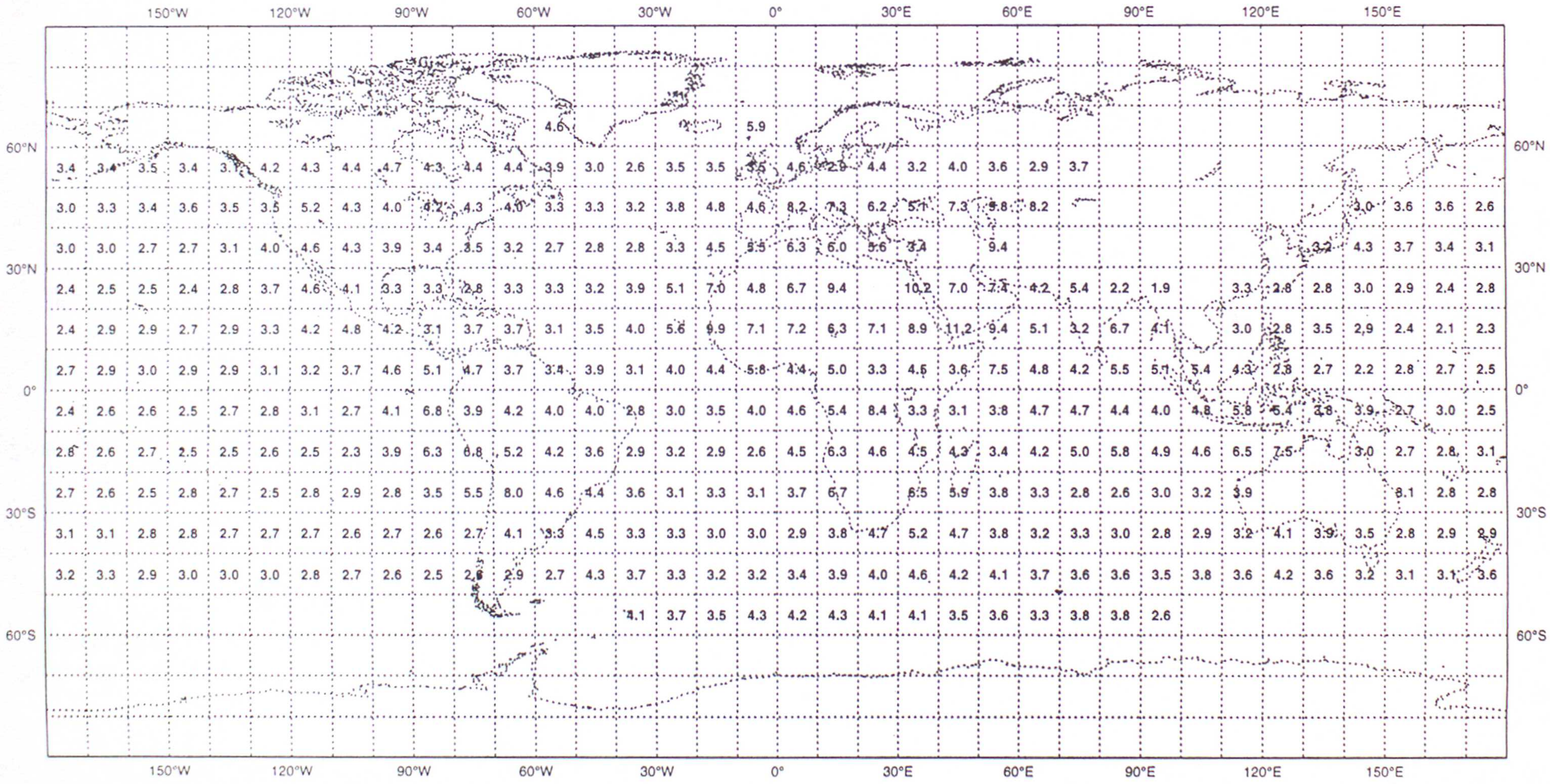

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.6 5.9
3.4 3.4 3.5 3.4 3.1 4.2 4.3 4.4 4.7 4.3 4.4 4.4 3.9 3.0 2.6 3.5 3.5 3.5 4.6 2.9 4.4 3.2 4.0 3.6 2.9 3.7
3.0 3.3 3.4 3.6 3.5 3.5 5.2 4.3 4.0 4.2 4.3 4.0 3.3 3.3 3.2 3.8 4.8 4.6 8.2 7.3 6.2 5.1 7.3 5.8 8.2 3.0 3.6 3.6 2.6
3.0 3.0 2.7 2.7 3.1 4.0 4.6 4.3 3.9 3.4 3.5 3.2 2.7 2.8 2.8 3.3 4.5 5.5 6.3 6.0 5.6 3.4 9.4 3.2 4.3 3.7 3.4 3.1
2.4 2.5 2.5 2.4 2.8 3.7 4.6 4.1 3.3 3.3 2.8 3.3 3.3 3.2 3.9 5.1 7.0 4.8 6.7 9.4 10.2 7.0 7.4 4.2 5.4 2.2 1.9 3.3 2.8 2.8 3.0 2.9 2.4 2.8
2.4 2.9 2.9 2.7 2.9 3.3 4.2 4.8 4.2 3.1 3.7 3.7 3.1 3.5 4.0 5.6 9.9 7.1 7.2 6.3 7.1 8.9 11.2 9.4 5.1 3.2 6.7 4.1 3.0 2.8 3.5 2.9 2.4 2.1 2.3
2.7 2.9 3.0 2.9 2.9 3.1 3.2 3.7 4.6 5.1 4.7 3.7 3.4 3.9 3.1 4.0 4.4 5.8 4.4 5.0 3.3 4.5 3.6 7.5 4.8 4.2 5.5 5.1 5.4 4.3 2.8 2.7 2.2 2.8 2.7 2.5
2.4 2.6 2.6 2.5 2.7 2.8 3.1 2.7 4.1 6.8 3.9 4.2 4.0 4.0 2.8 3.0 3.5 4.0 4.6 5.4 8.4 3.3 3.1 3.8 4.7 4.7 4.4 4.0 4.8 5.8 5.4 3.8 3.9 2.7 3.0 2.5
2.8 2.6 2.7 2.5 2.5 2.6 2.5 2.3 3.9 6.3 6.8 5.2 4.2 3.6 2.9 3.2 2.9 2.6 4.5 6.3 4.6 4.5 4.3 3.4 4.2 5.0 5.8 4.9 4.6 6.5 7.5 3.0 2.7 2.8 3.1
2.7 2.6 2.5 2.8 2.7 2.5 2.8 2.9 2.8 3.5 5.5 8.0 4.6 4.4 3.6 3.1 3.3 3.1 3.7 6.7 6.5 5.9 3.8 3.3 2.8 2.6 3.0 3.2 3.9 8.1 2.8 2.8
3.1 3.1 2.8 2.8 2.7 2.7 2.7 2.6 2.7 2.6 2.7 4.1 3.3 4.5 3.3 3.3 3.0 3.0 2.9 3.8 4.7 5.2 4.7 3.8 3.2 3.3 3.0 2.8 2.9 3.2 4.1 3.9 3.5 2.8 2.9 2.9
3.2 3.3 2.9 3.0 3.0 3.0 2.8 2.7 2.6 2.5 2.6 2.9 2.7 4.3 3.7 3.3 3.2 3.2 3.4 3.9 4.0 4.6 4.2 4.1 3.7 3.6 3.6 3.5 3.8 3.6 4.2 3.6 3.2 3.1 3.1 3.6
4.1 3.7 3.5 4.3 4.2 4.3 4.1 4.1 3.5 3.6 3.3 3.8 3.8 2.6

Figure 15. SATOB 401 - 700 hPa mean daily count. SEPTEMBER 2003
Global average number of observations in 24 hours = 12361

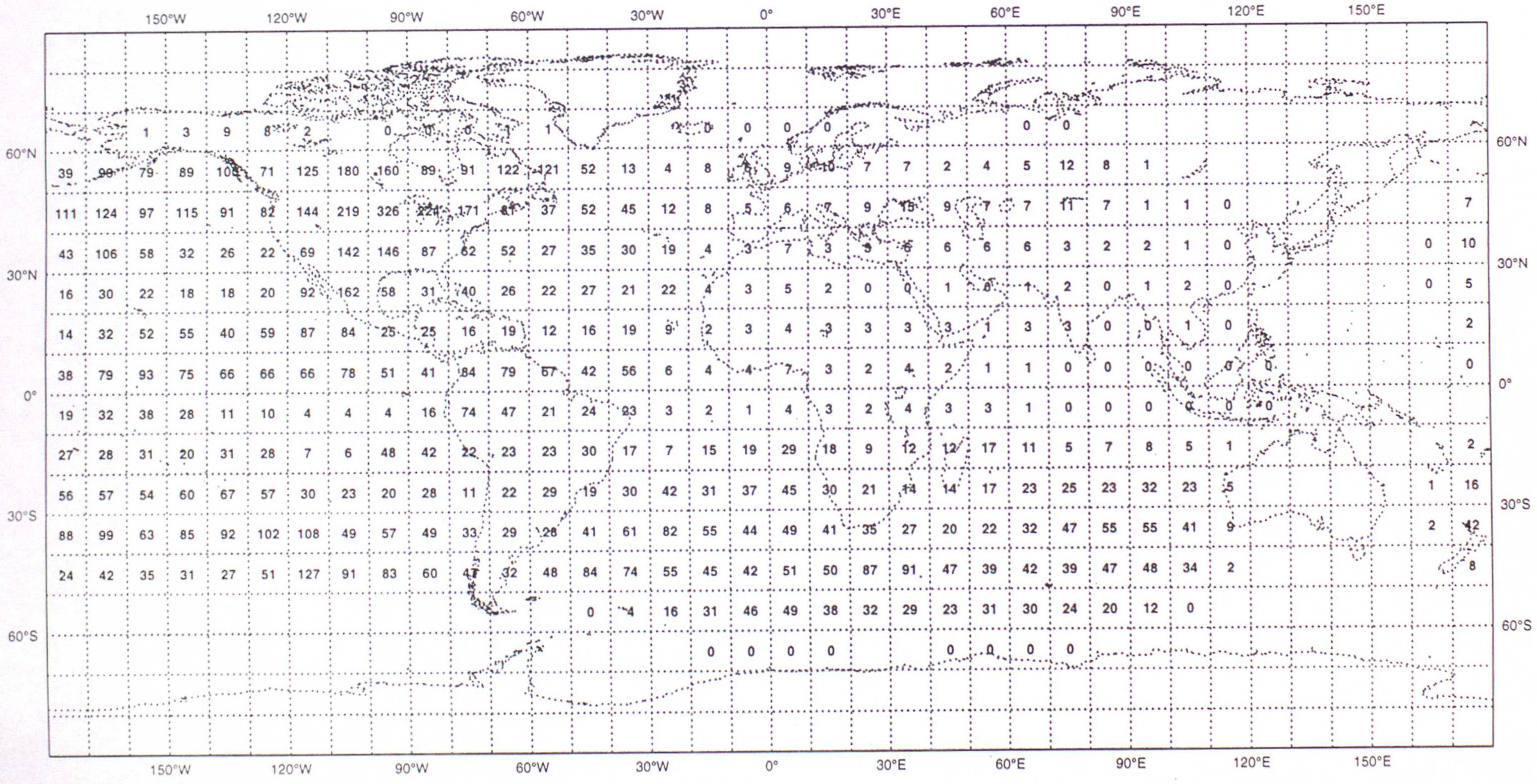

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1 3 9 8 2 0 0 0 1 1 0 0 0 0 0 0
39 98 79 89 108 71 125 180 160 89 91 122 121 52 13 4 8 6 9 10 7 7 2 4 5 12 8 1
111 124 97 115 91 82 144 219 326 224 171 81 37 52 45 12 8 5 6 7 9 15 9 7 7 11 7 1 1 0 7
43 106 58 32 26 22 69 142 146 87 62 52 27 35 30 19 4 3 7 3 5 6 6 6 6 3 2 2 1 0 0 10
16 30 22 18 18 20 92 162 58 31 40 26 22 27 21 22 4 3 5 2 0 0 1 0 1 2 0 1 2 0 0 5
14 32 52 55 40 59 87 84 25 25 16 19 12 16 19 9 2 3 4 3 3 3 3 1 3 3 0 0 1 0 2
38 79 93 75 66 66 66 78 51 41 84 79 67 42 56 6 4 4 7 3 2 4 2 1 1 0 0 0 0 0 0 0
19 32 38 28 11 10 4 4 4 16 74 47 21 24 23 3 2 1 4 3 2 4 3 3 1 0 0 0 0 0 0
27 28 31 20 31 28 7 6 48 42 22 23 23 30 17 7 15 19 29 18 9 12 12 17 11 5 7 8 5 1 2
56 57 54 60 67 57 30 23 20 28 11 22 29 19 30 42 31 37 45 30 21 14 14 17 23 25 23 32 23 5 1 16
88 99 63 85 92 102 108 49 57 49 33 29 28 41 61 82 55 44 49 41 35 27 20 22 32 47 55 55 41 9 2 42
24 42 35 31 27 51 127 91 83 60 47 32 48 84 74 55 45 42 51 50 87 91 47 39 42 39 47 48 34 2 8
0 4 16 31 46 49 38 32 29 23 31 30 24 20 12 0
0 0 0 0 0 0 0 0
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 16. SATOB 401 - 700 hPa vector mean wind. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

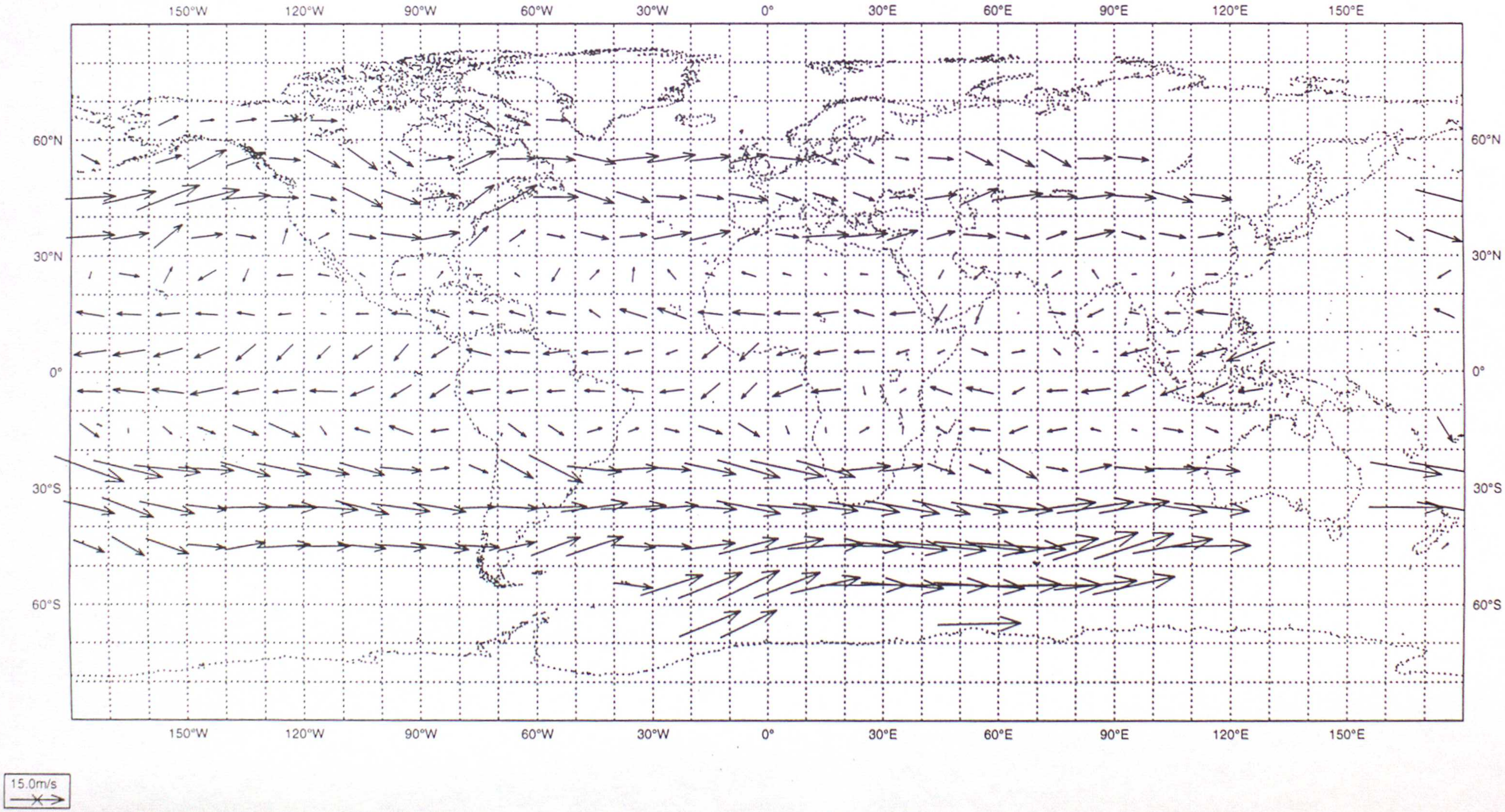

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

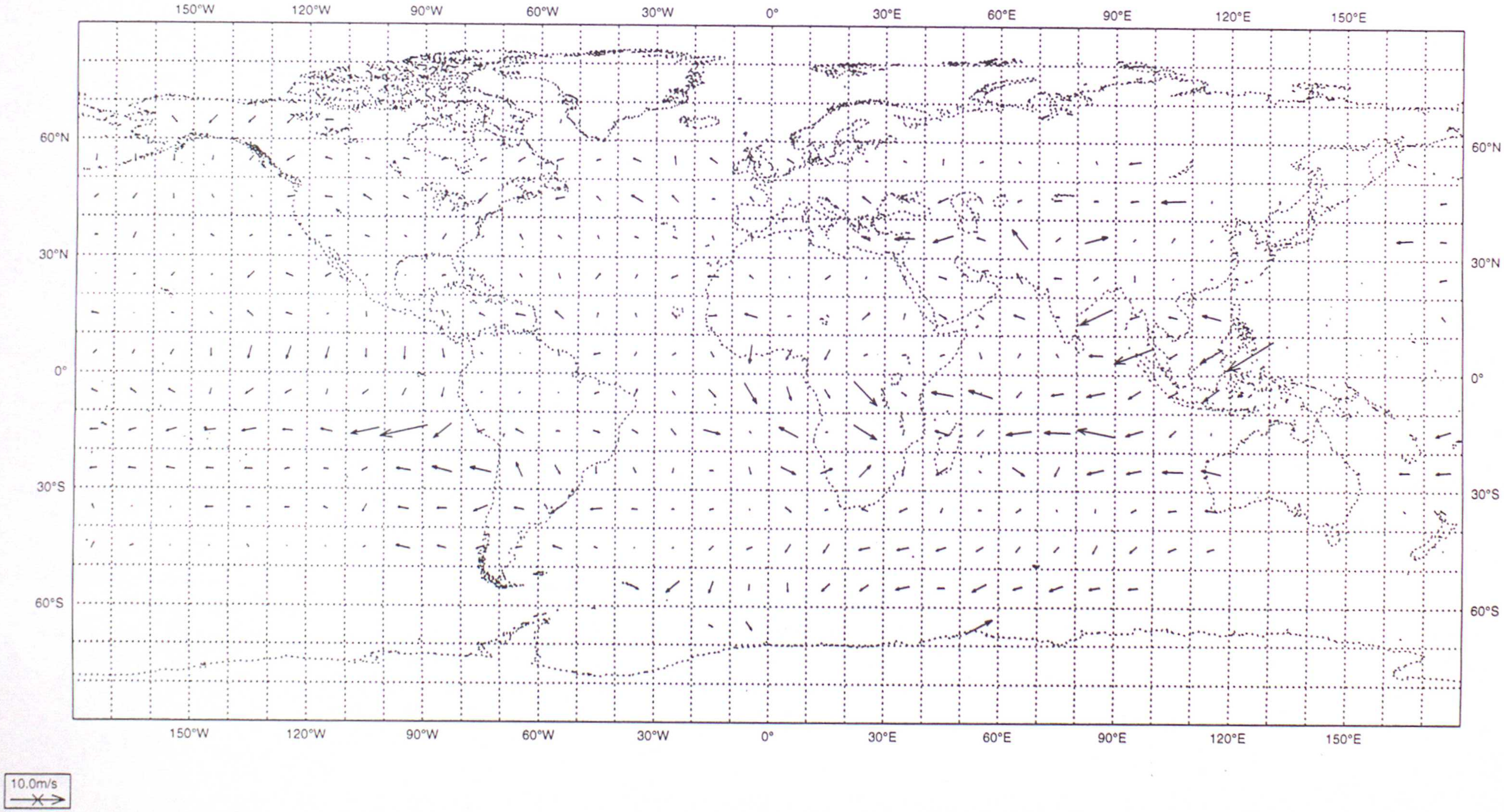

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

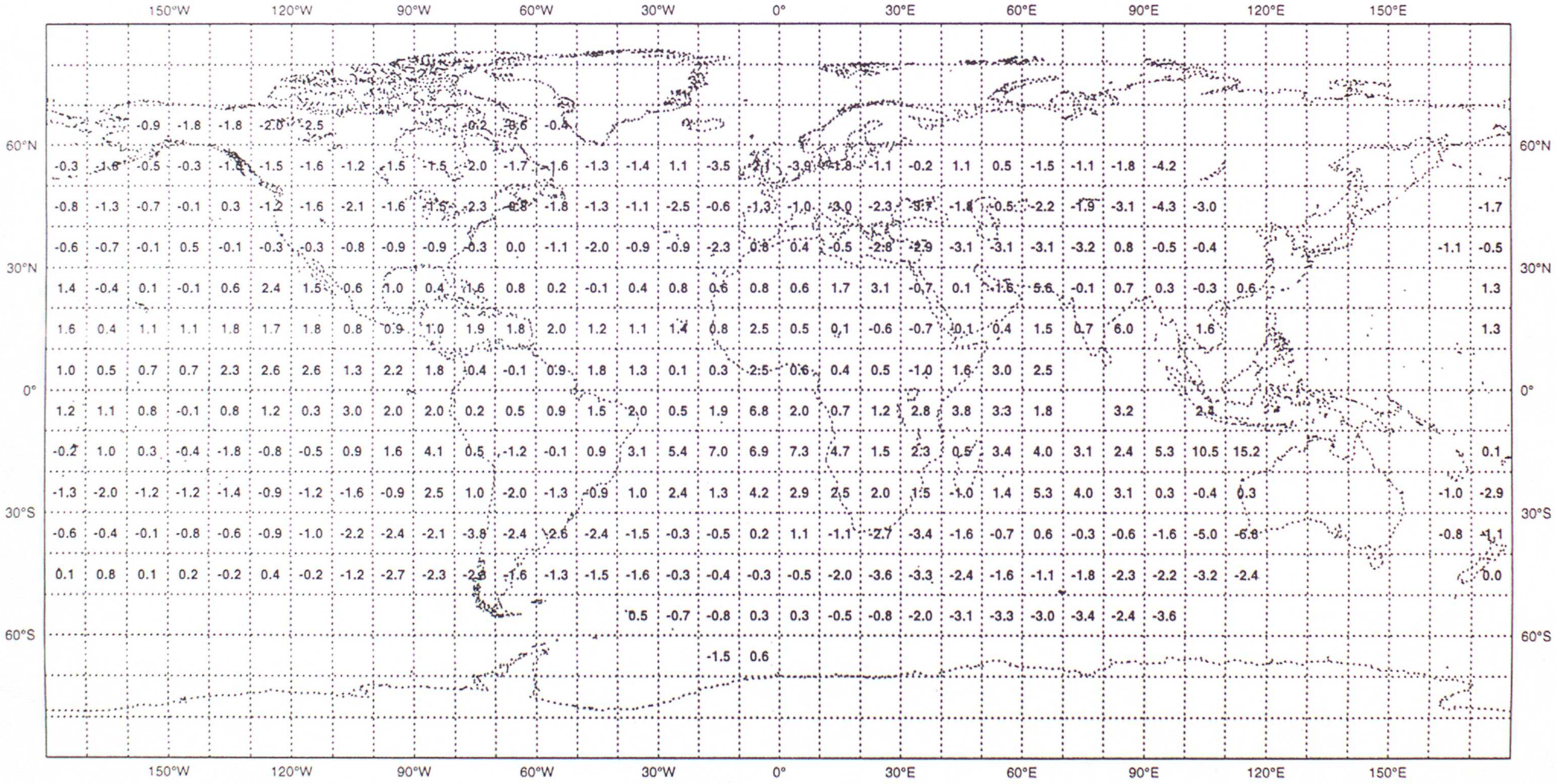

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-0.9 -1.8 -1.8 -2.0 -2.5 -0.2 -0.6 -0.4
-0.3 -1.6 -0.5 -0.3 -1.8 -1.5 -1.6 -1.2 -1.5 -1.5 -2.0 -1.7 -1.6 -1.3 -1.4 1.1 -3.5 -2.1 -3.9 -1.8 -1.1 -0.2 1.1 0.5 -1.5 -1.1 -1.8 -4.2
-0.8 -1.3 -0.7 -0.1 0.3 -1.2 -1.6 -2.1 -1.6 -1.5 -2.3 -2.8 -1.8 -1.3 -1.1 -2.5 -0.6 -1.3 -1.0 -3.0 -2.3 -3.7 -1.8 -0.5 -2.2 -1.9 -3.1 -4.3 -3.0 -1.7
-0.6 -0.7 -0.1 0.5 -0.1 -0.3 -0.3 -0.8 -0.9 -0.9 -0.3 0.0 -1.1 -2.0 -0.9 -0.9 -2.3 0.8 0.4 -0.5 -2.8 -2.9 -3.1 -3.1 -3.1 -3.2 0.8 -0.5 -0.4 -1.1 -0.5
1.4 -0.4 0.1 -0.1 0.6 2.4 1.5 -0.6 1.0 0.4 1.6 0.8 0.2 -0.1 0.4 0.8 0.6 0.8 0.6 1.7 3.1 -0.7 0.1 1.6 5.6 -0.1 0.7 0.3 -0.3 0.6 1.3
1.6 0.4 1.1 1.1 1.8 1.7 1.8 0.8 0.9 1.0 1.9 1.8 2.0 1.2 1.1 1.4 0.8 2.5 0.5 0.1 -0.6 -0.7 -0.1 0.4 1.5 0.7 6.0 1.6 1.3
1.0 0.5 0.7 0.7 2.3 2.6 2.6 1.3 2.2 1.8 0.4 -0.1 0.9 1.8 1.3 0.1 0.3 2.5 0.6 0.4 0.5 -1.0 1.6 3.0 2.5
1.2 1.1 0.8 -0.1 0.8 1.2 0.3 3.0 2.0 2.0 0.2 0.5 0.9 1.5 2.0 0.5 1.9 6.8 2.0 0.7 1.2 2.8 3.8 3.3 1.8 3.2 2.4
-0.2 1.0 0.3 -0.4 -1.8 -0.8 -0.5 0.9 1.6 4.1 0.5 -1.2 -0.1 0.9 3.1 5.4 7.0 6.9 7.3 4.7 1.5 2.3 0.5 3.4 4.0 3.1 2.4 5.3 10.5 15.2 0.1
-1.3 -2.0 -1.2 -1.2 -1.4 -0.9 -1.2 -1.6 -0.9 2.5 1.0 -2.0 -1.3 -0.9 1.0 2.4 1.3 4.2 2.9 2.5 2.0 1.5 -1.0 1.4 5.3 4.0 3.1 0.3 -0.4 0.3 -1.0 -2.9
-0.6 -0.4 -0.1 -0.8 -0.6 -0.9 -1.0 -2.2 -2.4 -2.1 -3.8 -2.4 -2.6 -2.4 -1.5 -0.3 -0.5 0.2 1.1 -1.1 -2.7 -3.4 -1.6 -0.7 0.6 -0.3 -0.6 -1.6 -5.0 -6.8 -0.8 -1.1
0.1 0.8 0.1 0.2 -0.2 0.4 -0.2 -1.2 -2.7 -2.3 -2.8 -1.6 -1.3 -1.5 -1.6 -0.3 -0.4 -0.3 -0.5 -2.0 -3.6 -3.3 -2.4 -1.6 -1.1 -1.8 -2.3 -2.2 -3.2 -2.4 0.0
0.5 -0.7 -0.8 0.3 0.3 -0.5 -0.8 -2.0 -3.1 -3.3 -3.0 -3.4 -2.4 -3.6
-1.5 0.6

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

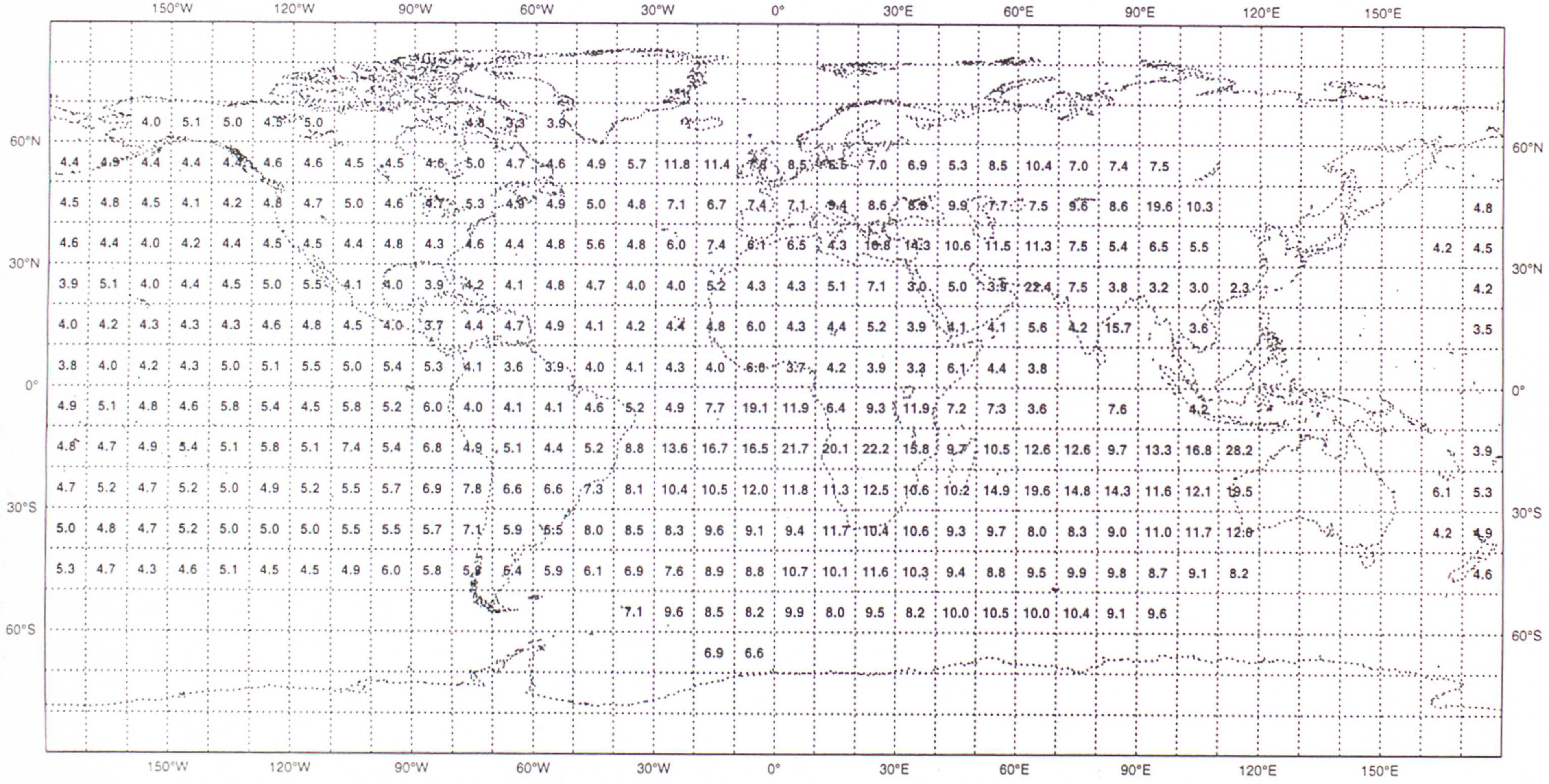

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
4.0 5.1 5.0 4.5 5.0 4.8 3.3 3.9
4.4 4.9 4.4 4.4 4.4 4.6 4.6 4.5 4.5 4.6 5.0 4.7 4.6 4.9 5.7 11.8 11.4 7.8 8.5 6.5 7.0 6.9 5.3 8.5 10.4 7.0 7.4 7.5
4.5 4.8 4.5 4.1 4.2 4.8 4.7 5.0 4.6 4.7 5.3 4.9 4.9 5.0 4.8 7.1 6.7 7.4 7.1 9.4 8.6 8.8 9.9 7.7 7.5 9.6 8.6 19.6 10.3 4.8
4.6 4.4 4.0 4.2 4.4 4.5 4.5 4.4 4.8 4.3 4.6 4.4 4.8 5.6 4.8 6.0 7.4 6.1 6.5 4.3 16.8 14.3 10.6 11.5 11.3 7.5 5.4 6.5 5.5 4.2 4.5
3.9 5.1 4.0 4.4 4.5 5.0 5.5 4.1 4.0 3.9 4.2 4.1 4.8 4.7 4.0 4.0 5.2 4.3 4.3 5.1 7.1 3.0 5.0 3.9 22.4 7.5 3.8 3.2 3.0 2.3 4.2
4.0 4.2 4.3 4.3 4.3 4.6 4.8 4.5 4.0 3.7 4.4 4.7 4.9 4.1 4.2 4.4 4.8 6.0 4.3 4.4 5.2 3.9 4.1 4.1 5.6 4.2 15.7 3.6 3.5
3.8 4.0 4.2 4.3 5.0 5.1 5.5 5.0 5.4 5.3 4.1 3.6 3.9 4.0 4.1 4.3 4.0 6.0 3.7 4.2 3.9 3.3 6.1 4.4 3.8
4.9 5.1 4.8 4.6 5.8 5.4 4.5 5.8 5.2 6.0 4.0 4.1 4.1 4.6 5.2 4.9 7.7 19.1 11.9 6.4 9.3 11.9 7.2 7.3 3.6 7.6 4.2
4.8 4.7 4.9 5.4 5.1 5.8 5.1 7.4 5.4 6.8 4.9 5.1 4.4 5.2 8.8 13.6 16.7 16.5 21.7 20.1 22.2 15.8 9.7 10.5 12.6 12.6 9.7 13.3 16.8 28.2 3.9
4.7 5.2 4.7 5.2 5.0 4.9 5.2 5.5 5.7 6.9 7.8 6.6 6.6 7.3 8.1 10.4 10.5 12.0 11.8 11.3 12.5 10.6 10.2 14.9 19.6 14.8 14.3 11.6 12.1 19.5 6.1 5.3
5.0 4.8 4.7 5.2 5.0 5.0 5.0 5.5 5.5 5.7 7.1 5.9 6.5 8.0 8.5 8.3 9.6 9.1 9.4 11.7 10.4 10.6 9.3 9.7 8.0 8.3 9.0 11.0 11.7 12.0 4.2 4.9
5.3 4.7 4.3 4.6 5.1 4.5 4.5 4.9 6.0 5.8 5.8 5.4 5.9 6.1 6.9 7.6 8.9 8.8 10.7 10.1 11.6 10.3 9.4 8.8 9.5 9.9 9.8 8.7 9.1 8.2 4.6
7.1 9.6 8.5 8.2 9.9 8.0 9.5 8.2 10.0 10.5 10.0 10.4 9.1 9.6
6.9 6.6
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

Figure 20. SATOB 101 - 400 hPa mean daily count. SEPTEMBER 2003
Global average number of observations in 24 hours = 168340

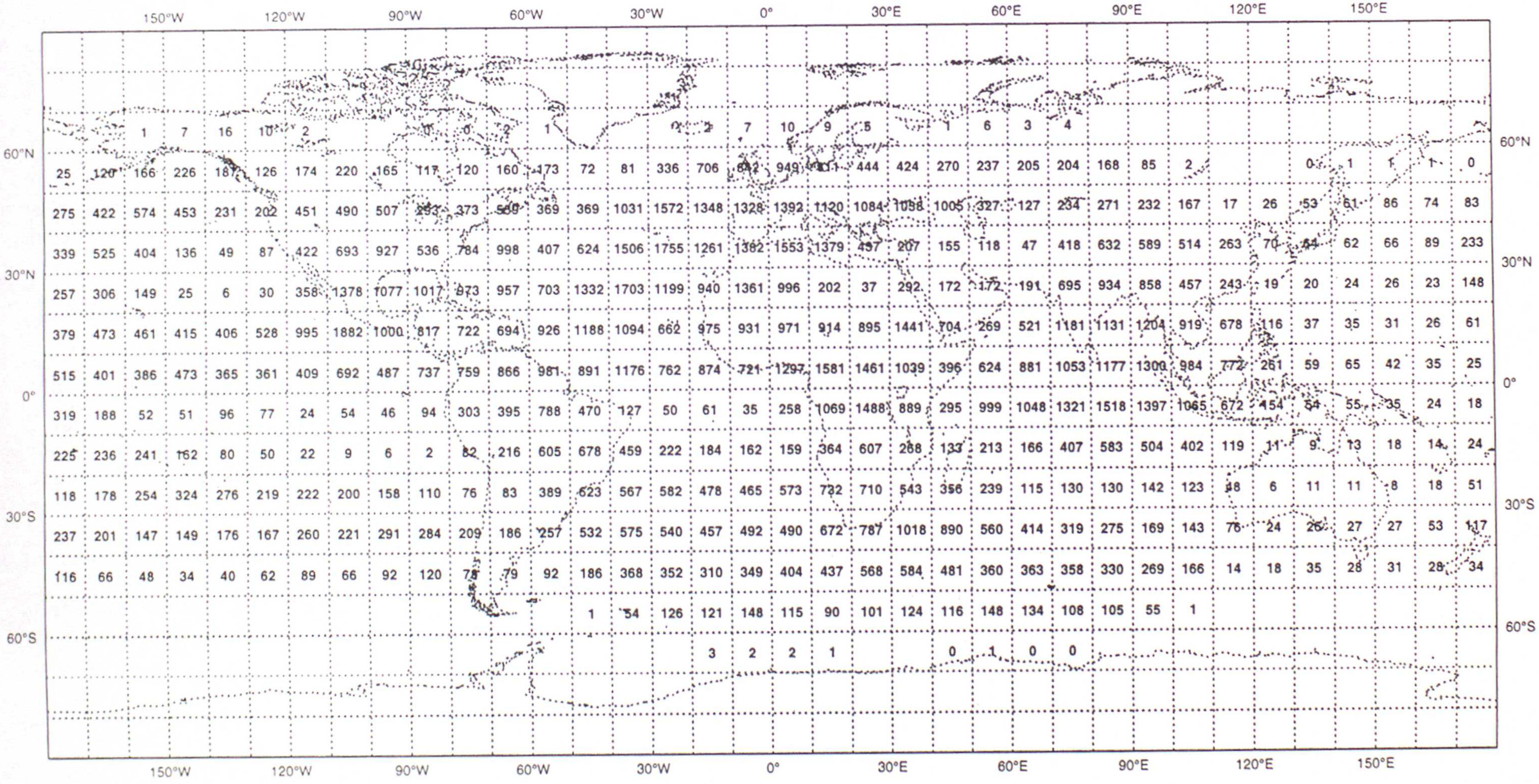

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 7 16 10 2 0 0 2 1 2 7 10 9 5 1 6 3 4
25 120 166 226 187 126 174 220 165 117 120 160 173 72 81 336 706 642 949 [illegible] 444 424 270 237 205 204 168 85 2 0 1 1 1 0
275 422 574 453 231 202 451 490 507 293 373 569 369 369 1031 1572 1348 1328 1392 1120 1084 1058 1005 327 127 234 271 232 167 17 26 53 61 86 74 83
339 525 404 136 49 87 422 693 927 536 784 998 407 624 1506 1755 1261 1382 1553 1379 457 207 155 118 47 418 632 589 514 263 70 44 62 66 89 233
257 306 149 25 6 30 358 1378 1077 1017 873 957 703 1332 1703 1199 940 1361 996 202 37 292 172 172 191 695 934 858 457 243 19 20 24 26 23 148
379 473 461 415 406 528 995 1882 1000 817 722 694 926 1188 1094 662 975 931 971 914 895 1441 704 269 521 1181 1131 1204 919 678 116 37 35 31 26 61
515 401 386 473 365 361 409 692 487 737 759 866 981 891 1176 762 874 721 1297 1581 1461 1039 396 624 881 1053 1177 1300 984 772 261 59 65 42 35 25
319 188 52 51 96 77 24 54 46 94 303 395 788 470 127 50 61 35 258 1069 1488 889 295 999 1048 1321 1518 1397 1065 672 454 54 55 35 24 18
225 236 241 162 80 50 22 9 6 2 82 216 605 678 459 222 184 162 159 364 607 288 133 213 166 407 583 504 402 119 11 9 13 18 14 24
118 178 254 324 276 219 222 200 158 110 76 83 389 623 567 582 478 465 573 732 710 543 356 239 115 130 130 142 123 48 6 11 11 8 18 51
237 201 147 149 176 167 260 221 291 284 209 186 257 532 575 540 457 492 490 672 787 1018 890 560 414 319 275 169 143 76 24 26 27 27 53 117
116 66 48 34 40 62 89 66 92 120 78 79 92 186 368 352 310 349 404 437 568 584 481 360 363 358 330 269 166 14 18 35 28 31 28 34
1 54 126 121 148 115 90 101 124 116 148 134 108 105 55 1
3 2 2 1 0 1 0 0

Figure 21. SATOB 101 - 400 hPa vector mean wind. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

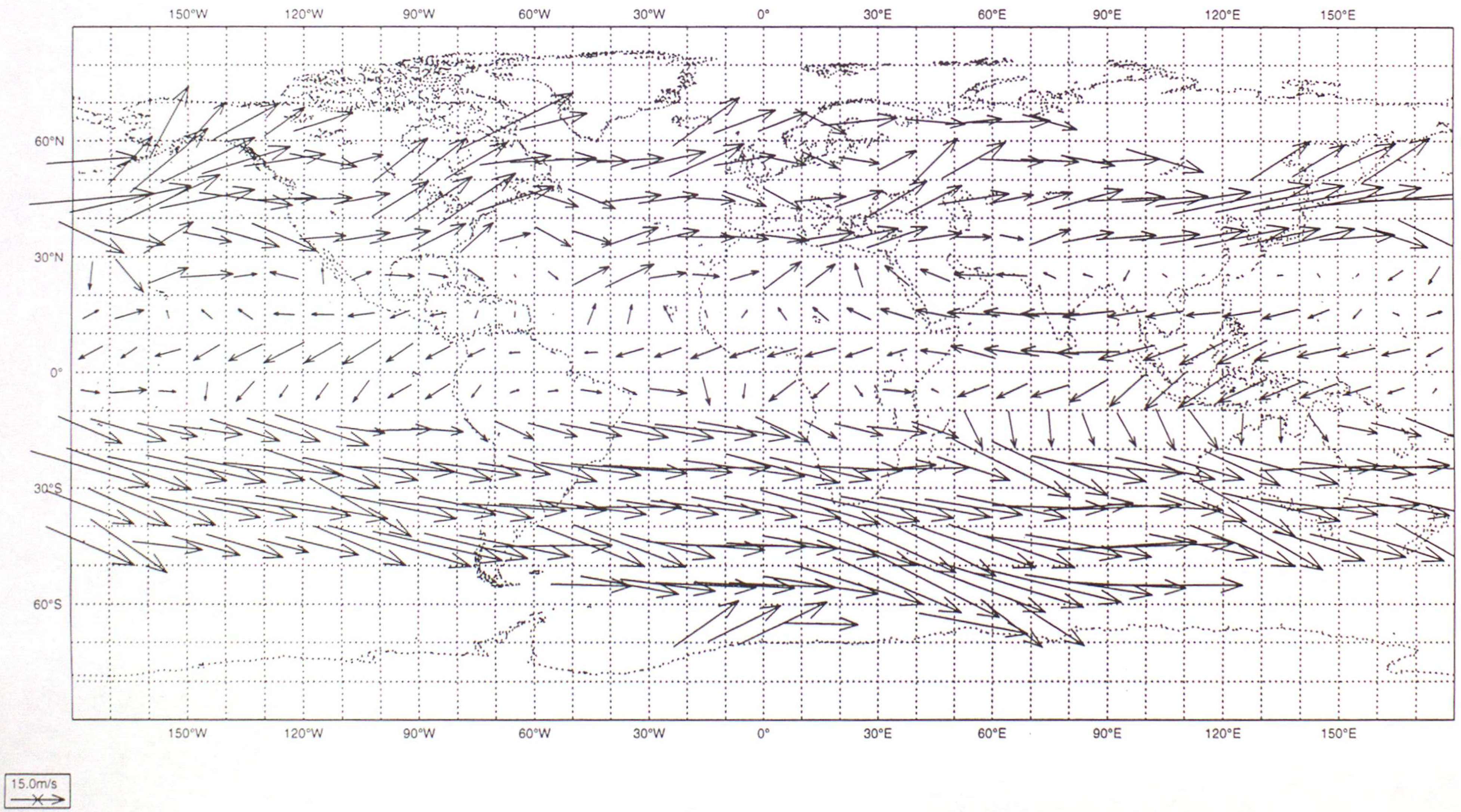

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. SEPTEMBER 2003
All observations
Arrows are plotted where greater than 10 obs are present

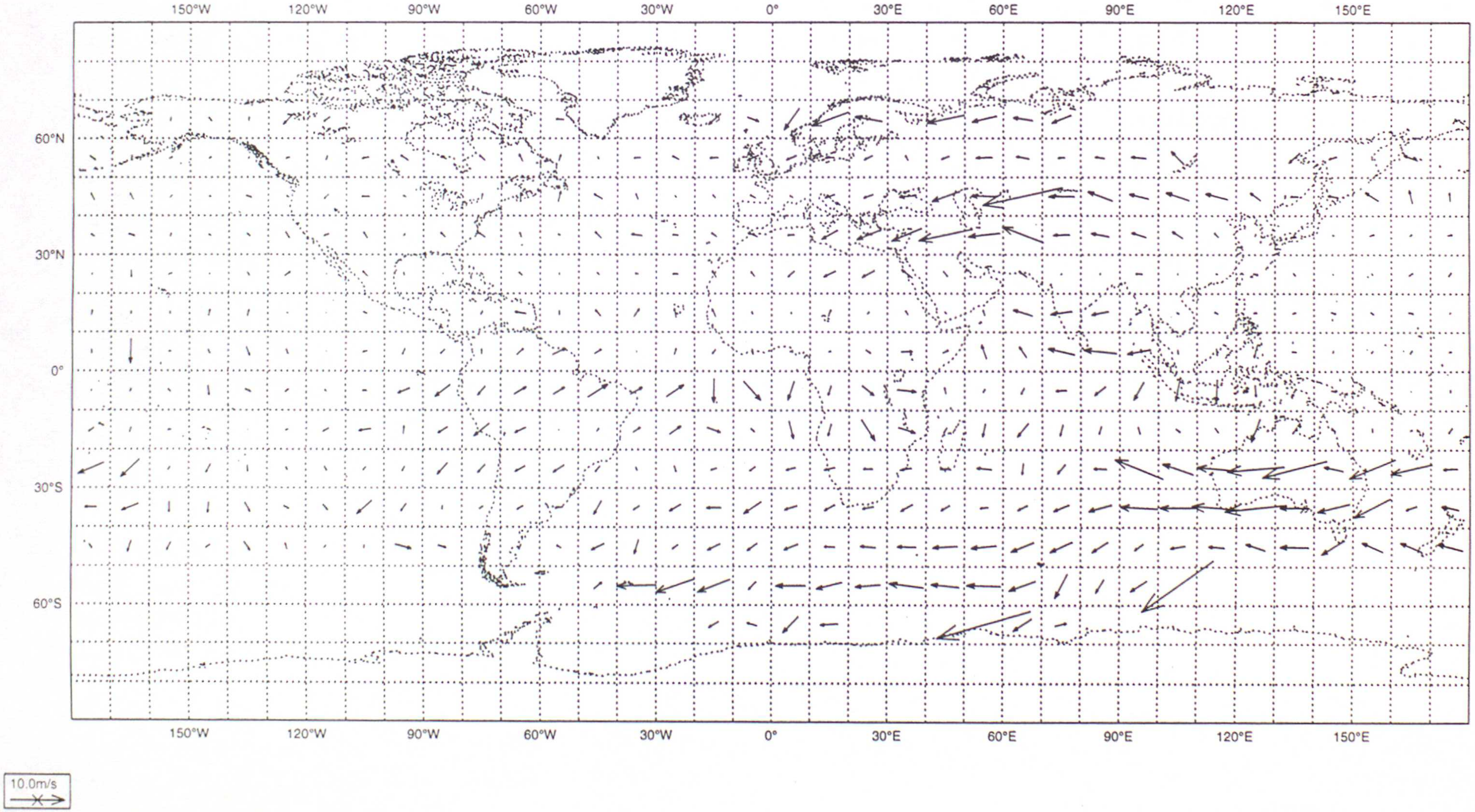

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present

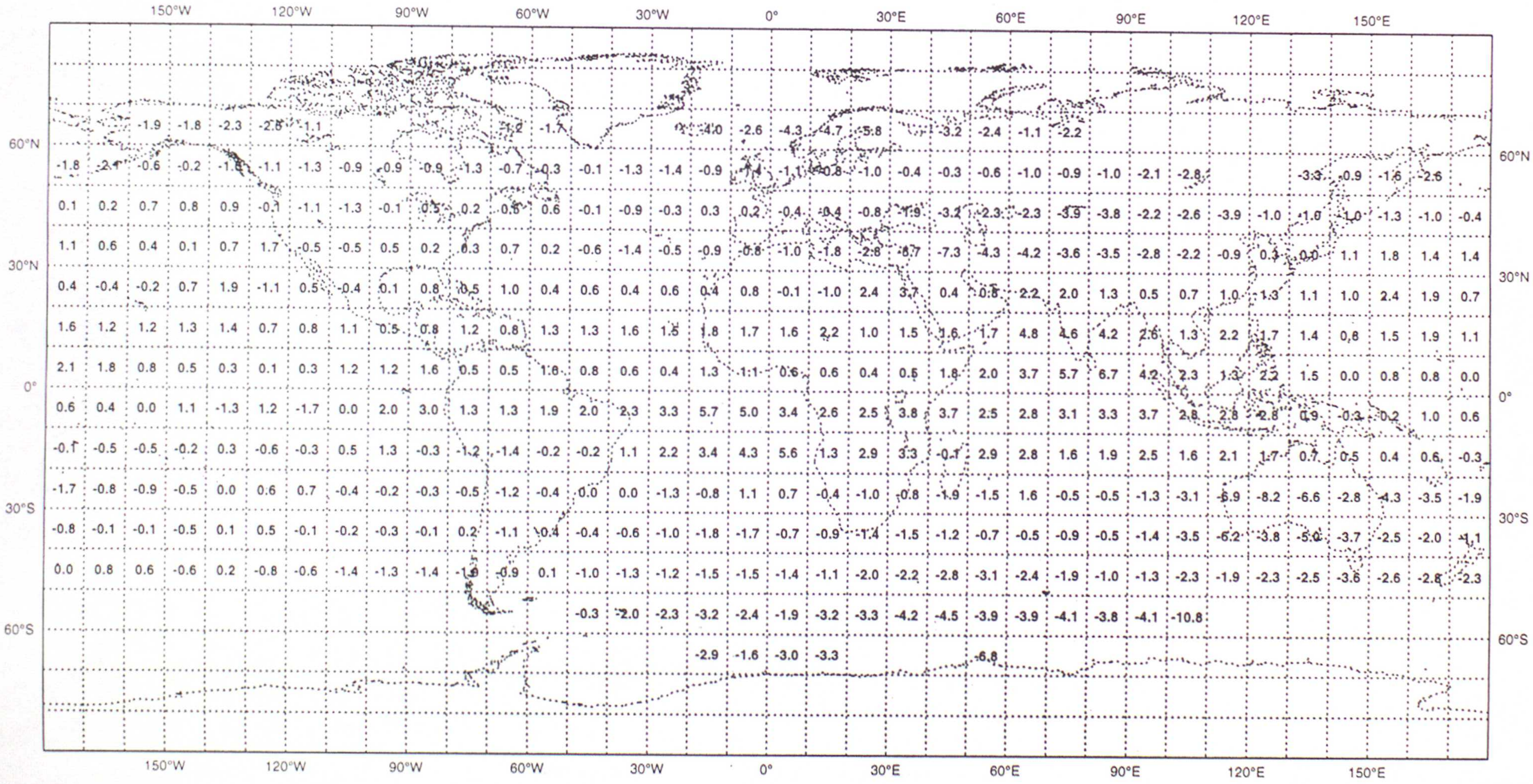
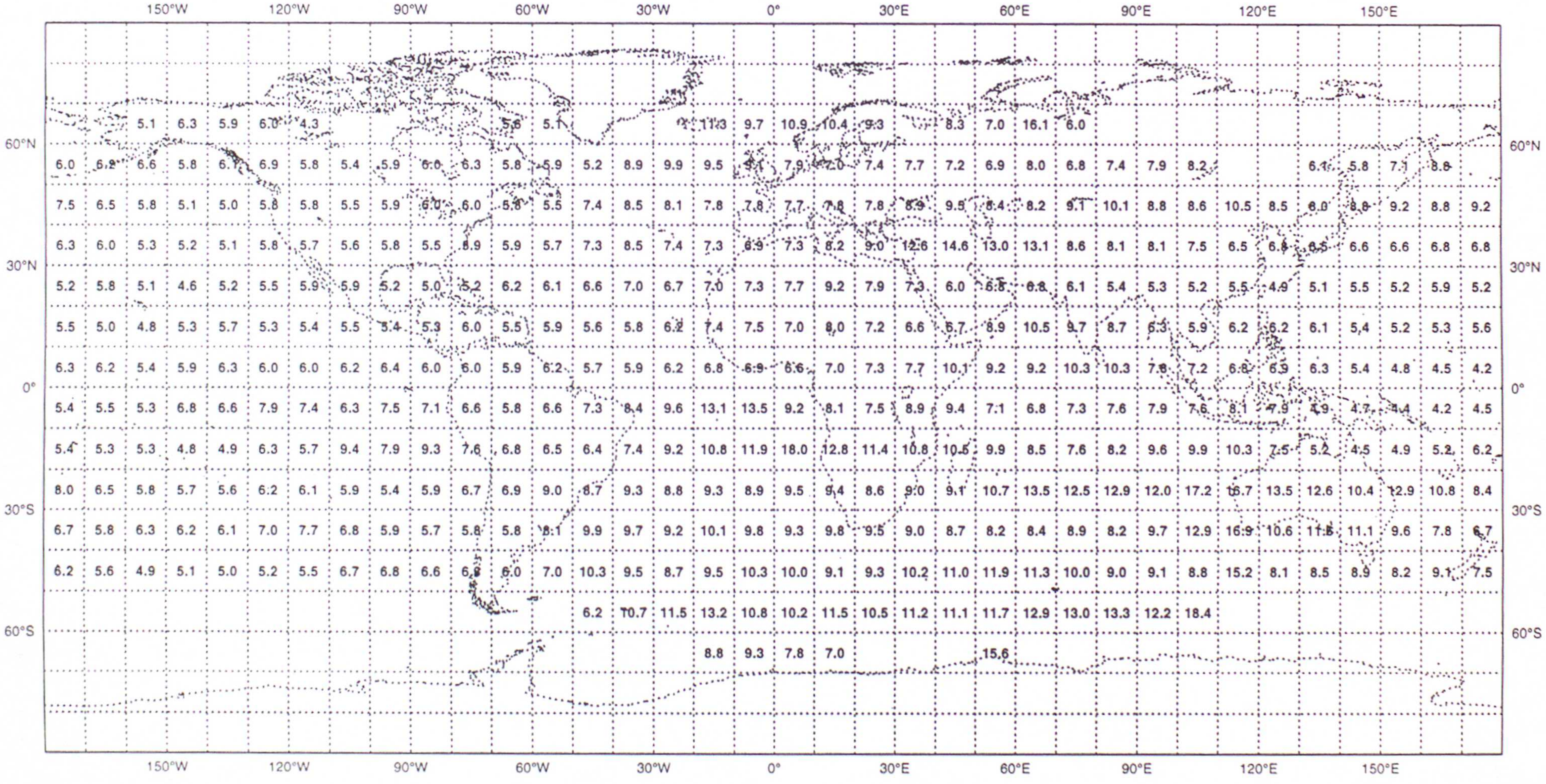

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.9 -1.8 -2.3 -2.8 -1.1 -1.2 -1.7 -4.0 -2.6 -4.3 -4.7 -5.8 -3.2 -2.4 -1.1 -2.2
-1.8 -2.1 -0.6 -0.2 -1.8 -1.1 -1.3 -0.9 -0.9 -0.9 -1.3 -0.7 -0.3 -0.1 -1.3 -1.4 -0.9 -1.4 -1.1 -0.8 -1.0 -0.4 -0.3 -0.6 -1.0 -0.9 -1.0 -2.1 -2.8 -3.3 -0.9 -1.6 -2.6
0.1 0.2 0.7 0.8 0.9 -0.1 -1.1 -1.3 -0.1 0.5 0.2 -0.5 0.6 -0.1 -0.9 -0.3 0.3 0.2 -0.4 -0.4 -0.8 -1.9 -3.2 -2.3 -2.3 -3.9 -3.8 -2.2 -2.6 -3.9 -1.0 -1.0 -1.0 -1.3 -1.0 -0.4
1.1 0.6 0.4 0.1 0.7 1.7 -0.5 -0.5 0.5 0.2 0.3 0.7 0.2 -0.6 -1.4 -0.5 -0.9 -0.8 -1.0 -1.8 -2.8 -8.7 -7.3 -4.3 -4.2 -3.6 -3.5 -2.8 -2.2 -0.9 0.3 0.0 1.1 1.8 1.4 1.4
0.4 -0.4 -0.2 0.7 1.9 -1.1 0.5 -0.4 0.1 0.8 0.5 1.0 0.4 0.6 0.4 0.6 0.4 0.8 -0.1 -1.0 2.4 3.7 0.4 0.8 2.2 2.0 1.3 0.5 0.7 1.0 1.3 1.1 1.0 2.4 1.9 0.7
1.6 1.2 1.2 1.3 1.4 0.7 0.8 1.1 0.5 0.8 1.2 0.8 1.3 1.3 1.6 1.5 1.8 1.7 1.6 2.2 1.0 1.5 1.6 1.7 4.8 4.6 4.2 2.6 1.3 2.2 1.7 1.4 0.8 1.5 1.9 1.1
2.1 1.8 0.8 0.5 0.3 0.1 0.3 1.2 1.2 1.6 0.5 0.5 1.6 0.8 0.6 0.4 1.3 1.1 0.6 0.6 0.4 0.6 1.8 2.0 3.7 5.7 6.7 4.2 2.3 1.3 2.2 1.5 0.0 0.8 0.8 0.0
0.6 0.4 0.0 1.1 -1.3 1.2 -1.7 0.0 2.0 3.0 1.3 1.3 1.9 2.0 2.3 3.3 5.7 5.0 3.4 2.6 2.5 3.8 3.7 2.5 2.8 3.1 3.3 3.7 2.8 2.8 2.8 1.9 -0.3 0.2 1.0 0.6
-0.1 -0.5 -0.5 -0.2 0.3 -0.6 -0.3 0.5 1.3 -0.3 -1.2 -1.4 -0.2 -0.2 1.1 2.2 3.4 4.3 5.6 1.3 2.9 3.3 -0.1 2.9 2.8 1.6 1.9 2.5 1.6 2.1 1.7 0.7 0.5 0.4 0.6 -0.3
-1.7 -0.8 -0.9 -0.5 0.0 0.6 0.7 -0.4 -0.2 -0.3 -0.5 -1.2 -0.4 0.0 0.0 -1.3 -0.8 1.1 0.7 -0.4 -1.0 0.8 -1.9 -1.5 1.6 -0.5 -0.5 -1.3 -3.1 -6.9 -8.2 -6.6 -2.8 -4.3 -3.5 -1.9
-0.8 -0.1 -0.1 -0.5 0.1 0.5 -0.1 -0.2 -0.3 -0.1 0.2 -1.1 0.4 -0.4 -0.6 -1.0 -1.8 -1.7 -0.7 -0.9 -1.4 -1.5 -1.2 -0.7 -0.5 -0.9 -0.5 -1.4 -3.5 -6.2 -3.8 -5.0 -3.7 -2.5 -2.0 -1.1
0.0 0.8 0.6 -0.6 0.2 -0.8 -0.6 -1.4 -1.3 -1.4 -1.9 -0.9 0.1 -1.0 -1.3 -1.2 -1.5 -1.5 -1.4 -1.1 -2.0 -2.2 -2.8 -3.1 -2.4 -1.9 -1.0 -1.3 -2.3 -1.9 -2.3 -2.5 -3.6 -2.6 -2.8 -2.3
-0.3 -2.0 -2.3 -3.2 -2.4 -1.9 -3.2 -3.3 -4.2 -4.5 -3.9 -3.9 -4.1 -3.8 -4.1 -10.8
-2.9 -1.6 -3.0 -3.3 -6.8

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). SEPTEMBER 2003
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5.1 6.3 5.9 6.0 4.3 5.6 5.1 11.3 9.7 10.9 10.4 9.3 8.3 7.0 16.1 6.0
6.0 6.2 6.6 5.8 6.1 6.9 5.8 5.4 5.9 6.0 6.3 5.8 5.9 5.2 8.9 9.9 9.5 9.1 7.9 12.0 7.4 7.7 7.2 6.9 8.0 6.8 7.4 7.9 8.2 6.4 5.8 7.1 8.8
7.5 6.5 5.8 5.1 5.0 5.8 5.8 5.5 5.9 6.0 6.0 5.8 5.5 7.4 8.5 8.1 7.8 7.8 7.7 7.8 7.8 8.9 9.5 8.4 8.2 9.1 10.1 8.8 8.6 10.5 8.5 6.0 8.8 9.2 8.8 9.2
6.3 6.0 5.3 5.2 5.1 5.8 5.7 5.6 5.8 5.5 8.9 5.9 5.7 7.3 8.5 7.4 7.3 6.9 7.3 8.2 9.0 12.6 14.6 13.0 13.1 8.6 8.1 8.1 7.5 6.5 6.8 6.5 6.6 6.6 6.8 6.8
5.2 5.8 5.1 4.6 5.2 5.5 5.9 5.9 5.2 5.0 5.2 6.2 6.1 6.6 7.0 6.7 7.0 7.3 7.7 9.2 7.9 7.3 6.0 6.8 6.8 6.1 5.4 5.3 5.2 5.5 4.9 5.1 5.5 5.2 5.9 5.2
5.5 5.0 4.8 5.3 5.7 5.3 5.4 5.5 5.4 5.3 6.0 5.5 5.9 5.6 5.8 6.2 7.4 7.5 7.0 8.0 7.2 6.6 6.7 8.9 10.5 9.7 8.7 6.3 5.9 6.2 6.2 6.1 5.4 5.2 5.3 5.6
6.3 6.2 5.4 5.9 6.3 6.0 6.0 6.2 6.4 6.0 6.0 5.9 6.2 5.7 5.9 6.2 6.8 6.9 6.6 7.0 7.3 7.7 10.1 9.2 9.2 10.3 10.3 7.8 7.2 6.8 6.9 6.3 5.4 4.8 4.5 4.2
5.4 5.5 5.3 6.8 6.6 7.9 7.4 6.3 7.5 7.1 6.6 5.8 6.6 7.3 8.4 9.6 13.1 13.5 9.2 8.1 7.5 8.9 9.4 7.1 6.8 7.3 7.6 7.9 7.6 8.1 7.9 4.9 4.7 4.4 4.2 4.5
5.4 5.3 5.3 4.8 4.9 6.3 5.7 9.4 7.9 9.3 7.6 6.8 6.5 6.4 7.4 9.2 10.8 11.9 18.0 12.8 11.4 10.8 10.5 9.9 8.5 7.6 8.2 9.6 9.9 10.3 7.5 5.2 4.5 4.9 5.2 6.2
8.0 6.5 5.8 5.7 5.6 6.2 6.1 5.9 5.4 5.9 6.7 6.9 9.0 8.7 9.3 8.8 9.3 8.9 9.5 9.4 8.6 9.0 9.1 10.7 13.5 12.5 12.9 12.0 17.2 16.7 13.5 12.6 10.4 12.9 10.8 8.4
6.7 5.8 6.3 6.2 6.1 7.0 7.7 6.8 5.9 5.7 5.8 5.8 8.1 9.9 9.7 9.2 10.1 9.8 9.3 9.8 9.5 9.0 8.7 8.2 8.4 8.9 8.2 9.7 12.9 16.9 10.6 11.6 11.1 9.6 7.8 6.7
6.2 5.6 4.9 5.1 5.0 5.2 5.5 6.7 6.8 6.6 6.8 6.0 7.0 10.3 9.5 8.7 9.5 10.3 10.0 9.1 9.3 10.2 11.0 11.9 11.3 10.0 9.0 9.1 8.8 15.2 8.1 8.5 8.9 8.2 9.1 7.5
6.2 10.7 11.5 13.2 10.8 10.2 11.5 10.5 11.2 11.1 11.7 12.9 13.0 13.3 12.2 18.4
8.8 9.3 7.8 7.0 15.6

MONITORING OF SATELLITE TEMPERATURES

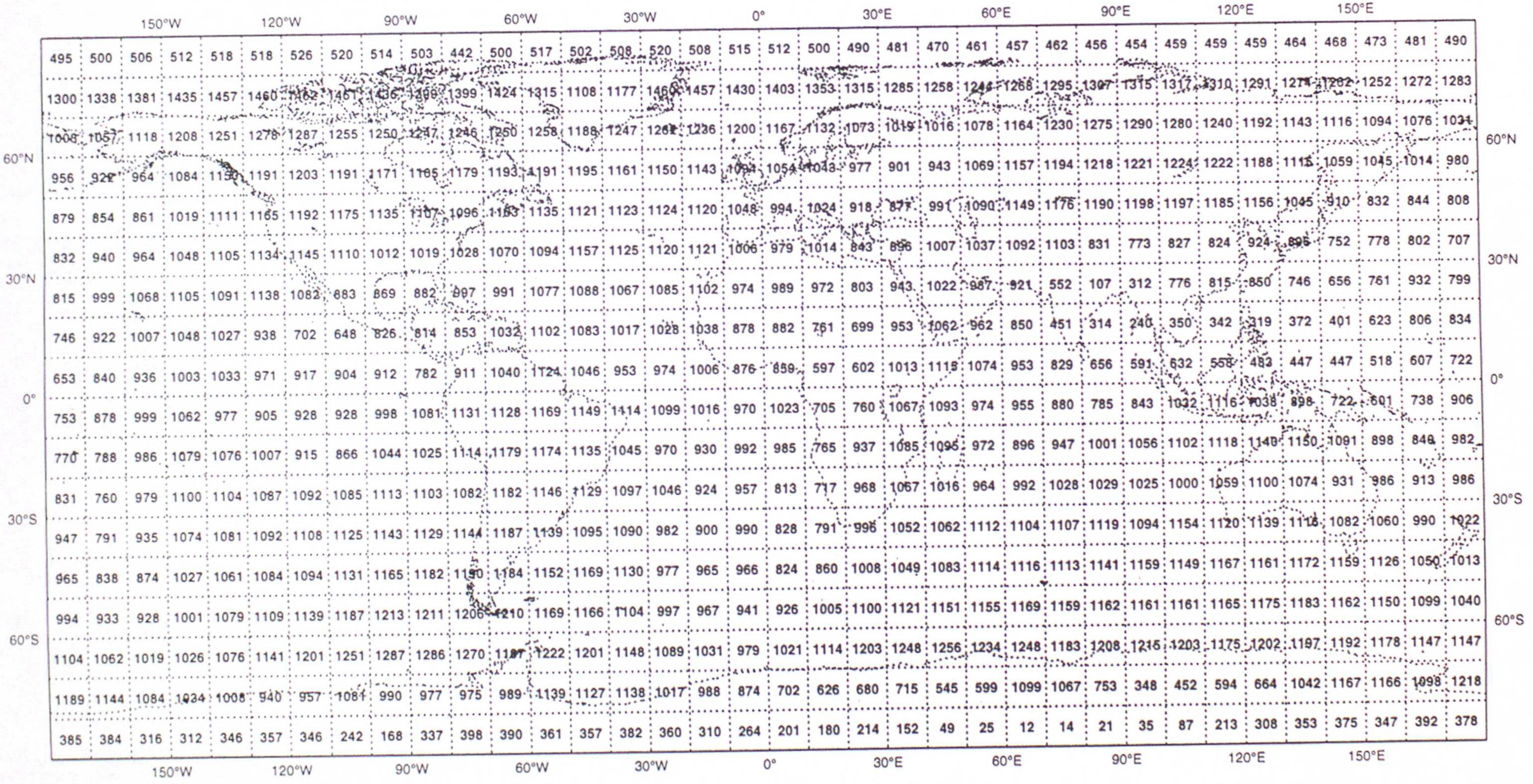
MONITORING CENTRE: BRACKNELL

MONTH: Sep 03

Monitoring procedures

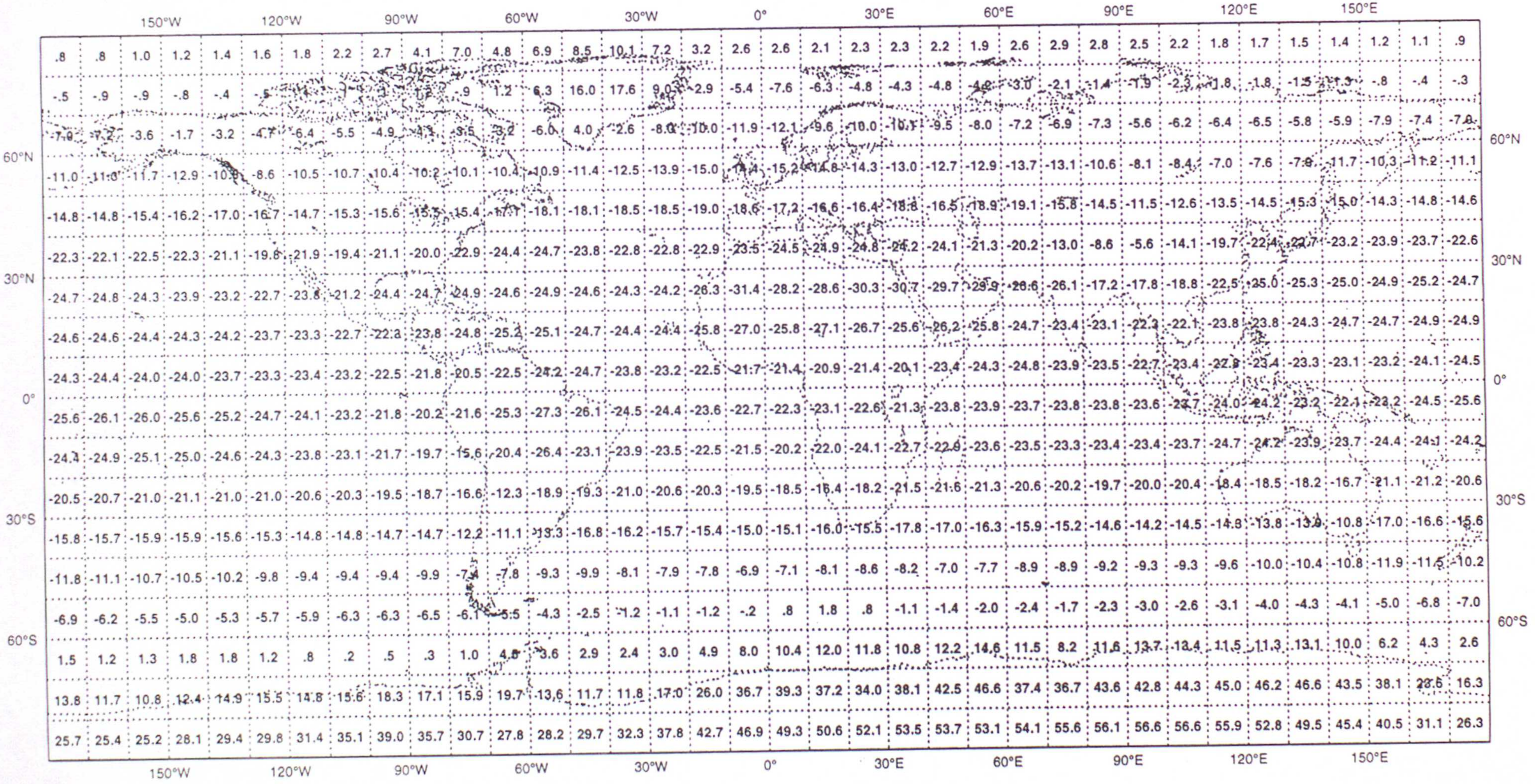
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100) :Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. SEPTEMBER 2003
NOAA15, using all observations
Global average number of observations in 24 hours = 618899



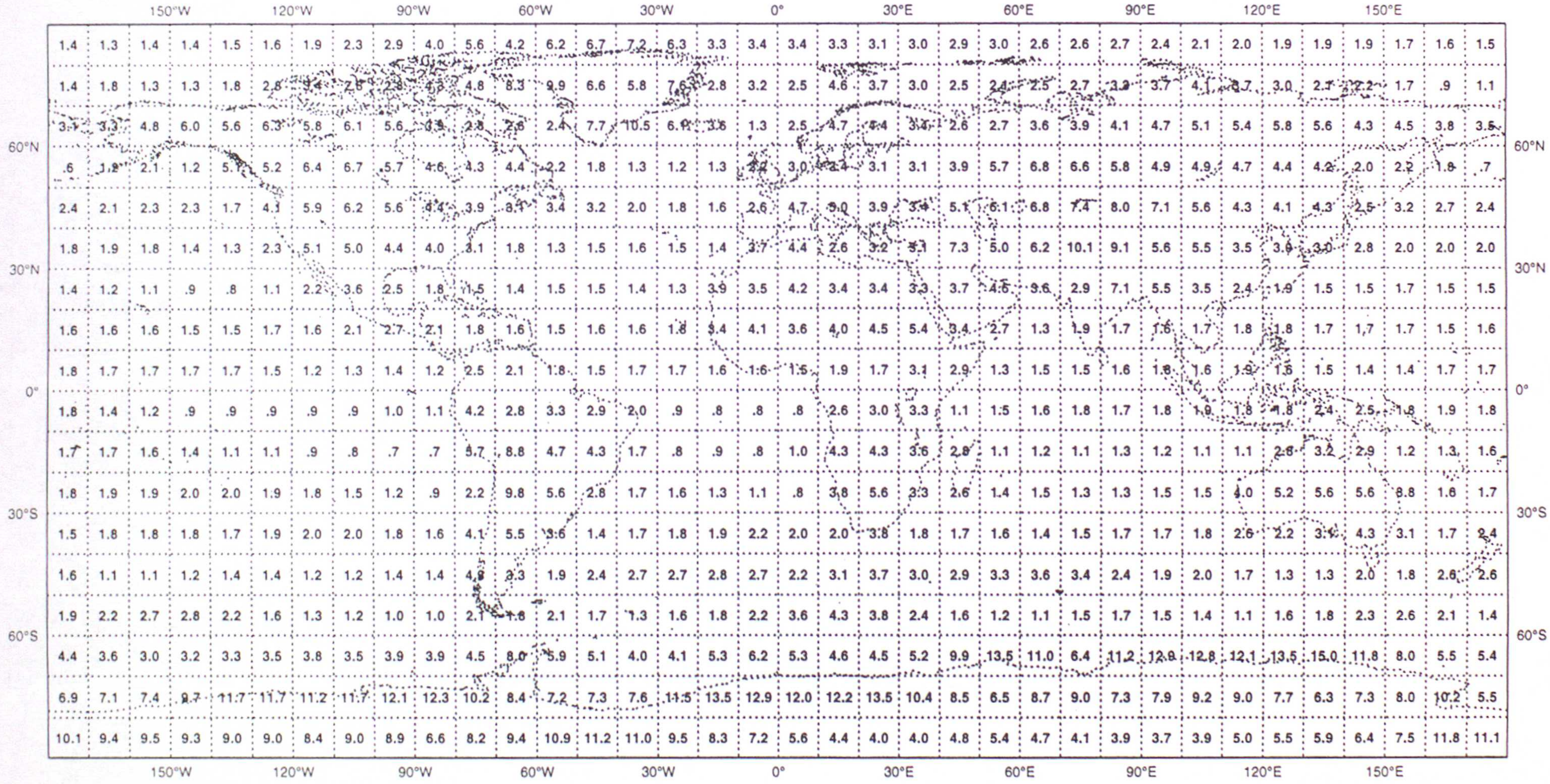
495	500	506	512	518	518	526	520	514	503	442	500	517	502	508	520	508	515	512	500	490	481	470	461	457	462	456	454	459	459	459	464	468	473	481	490
1300	1338	1381	1435	1457	1460	1462	1461	1436	1399	1399	1424	1315	1108	1177	1460	1457	1430	1403	1353	1315	1285	1258	1244	1268	1295	1307	1315	1317	1310	1291	1274	1282	1252	1272	1283
1006	1057	1118	1208	1251	1278	1287	1255	1250	1247	1246	1250	1258	1188	1247	1261	1236	1200	1167	1132	1073	1019	1016	1078	1164	1230	1275	1290	1280	1240	1192	1143	1116	1094	1076	1031
956	922	964	1084	1150	1191	1203	1191	1171	1165	1179	1193	1191	1195	1161	1150	1143	1094	1054	1043	977	901	943	1069	1157	1194	1218	1221	1224	1222	1188	1115	1059	1045	1014	980
879	854	861	1019	1111	1165	1192	1175	1135	1107	1096	1153	1135	1121	1123	1124	1120	1048	994	1024	918	877	991	1090	1149	1176	1190	1198	1197	1185	1156	1045	910	832	844	808
832	940	964	1048	1105	1134	1145	1110	1012	1019	1028	1070	1094	1157	1125	1120	1121	1006	979	1014	843	896	1007	1037	1092	1103	831	773	827	824	924	895	752	778	802	707
815	999	1068	1105	1091	1138	1082	883	869	882	997	991	1077	1088	1067	1085	1102	974	989	972	803	943	1022	987	921	552	107	312	776	815	850	746	656	761	932	799
746	922	1007	1048	1027	938	702	648	826	814	853	1032	1102	1083	1017	1028	1038	878	882	761	699	953	1062	962	850	451	314	240	350	342	319	372	401	623	806	834
653	840	936	1003	1033	971	917	904	912	782	911	1040	1124	1046	953	974	1006	876	859	597	602	1013	1115	1074	953	829	656	591	632	558	483	447	447	518	607	722
753	878	999	1062	977	905	928	928	998	1081	1131	1128	1169	1149	1114	1099	1016	970	1023	705	760	1067	1093	974	955	880	785	843	1032	1116	1038	898	722	601	738	906
770	788	986	1079	1076	1007	915	866	1044	1025	1114	1179	1174	1135	1045	970	930	992	985	765	937	1085	1095	972	896	947	1001	1056	1102	1118	1140	1150	1091	898	848	982
831	760	979	1100	1104	1087	1092	1085	1113	1103	1082	1182	1146	1129	1097	1046	924	957	813	717	968	1067	1016	964	992	1028	1029	1025	1000	1059	1100	1074	931	986	913	986
947	791	935	1074	1081	1092	1108	1125	1143	1129	1144	1187	1139	1095	1090	982	900	990	828	791	996	1052	1062	1112	1104	1107	1119	1094	1154	1120	1139	1116	1082	1060	990	1022
965	838	874	1027	1061	1084	1094	1131	1165	1182	1190	1184	1152	1169	1130	977	965	966	824	860	1008	1049	1083	1114	1116	1113	1141	1159	1149	1167	1161	1172	1159	1126	1050	1013
994	933	928	1001	1079	1109	1139	1187	1213	1211	1206	1210	1169	1166	1104	997	967	941	926	1005	1100	1121	1151	1155	1169	1159	1162	1161	1161	1165	1175	1183	1162	1150	1099	1040
1104	1062	1019	1026	1076	1141	1201	1251	1287	1286	1270	1187	1222	1201	1148	1089	1031	979	1021	1114	1203	1248	1256	1234	1248	1183	1208	1215	1203	1175	1202	1197	1192	1178	1147	1147
1189	1144	1084	1034	1008	940	957	1081	990	977	975	989	1139	1127	1138	1017	988	874	702	626	680	715	545	599	1099	1067	753	348	452	594	664	1042	1167	1166	1098	1218
385	384	316	312	346	357	346	242	168	337	398	390	361	357	382	360	310	264	201	180	214	152	49	25	12	14	21	35	87	213	308	353	375	347	392	378

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS8 (Surface)
NOAA15, using all observations



.8	.8	1.0	1.2	1.4	1.6	1.8	2.2	2.7	4.1	7.0	4.8	6.9	8.5	10.1	7.2	3.2	2.6	2.6	2.1	2.3	2.3	2.2	1.9	2.6	2.9	2.8	2.5	2.2	1.8	1.7	1.5	1.4	1.2	1.1	.9
-.5	-.9	-.9	-.8	-.4	-.5	[illegible]	[illegible]	[illegible]	[illegible]	-.9	1.2	6.3	16.0	17.6	9.0	-2.9	-5.4	-7.6	-6.3	-4.8	-4.3	-4.8	-4.2	-3.0	-2.1	-1.4	-1.9	-2.3	-1.8	-1.8	-1.5	-1.3	-.8	-.4	-.3
-7.0	-7.2	-3.6	-1.7	-3.2	-4.7	-6.4	-5.5	-4.9	-4.3	-3.5	-3.2	-6.0	4.0	-2.6	-8.0	-10.0	-11.9	-12.1	-9.6	-10.0	-10.1	-9.5	-8.0	-7.2	-6.9	-7.3	-5.6	-6.2	-6.4	-6.5	-5.8	-5.9	-7.9	-7.4	-7.0
-11.0	-11.0	-11.7	-12.9	-10.8	-8.6	-10.5	-10.7	-10.4	-10.2	-10.1	-10.4	-10.9	-11.4	-12.5	-13.9	-15.0	-14.4	-15.2	-14.8	-14.3	-13.0	-12.7	-12.9	-13.7	-13.1	-10.6	-8.1	-8.4	-7.0	-7.6	-7.8	-11.7	-10.3	-11.2	-11.1
-14.8	-14.8	-15.4	-16.2	-17.0	-16.7	-14.7	-15.3	-15.6	-15.5	-15.4	-17.1	-18.1	-18.1	-18.5	-18.5	-19.0	-18.6	-17.2	-16.6	-16.4	-18.8	-16.5	-18.9	-19.1	-15.8	-14.5	-11.5	-12.6	-13.5	-14.5	-15.3	-15.0	-14.3	-14.8	-14.6
-22.3	-22.1	-22.5	-22.3	-21.1	-19.8	-21.9	-19.4	-21.1	-20.0	-22.9	-24.4	-24.7	-23.8	-22.8	-22.8	-22.9	-23.5	-24.5	-24.9	-24.8	-24.2	-24.1	-21.3	-20.2	-13.0	-8.6	-5.6	-14.1	-19.7	-22.4	-22.7	-23.2	-23.9	-23.7	-22.6
-24.7	-24.8	-24.3	-23.9	-23.2	-22.7	-23.8	-21.2	-24.4	-24.7	-24.9	-24.6	-24.9	-24.6	-24.3	-24.2	-26.3	-31.4	-28.2	-28.6	-30.3	-30.7	-29.7	-29.9	-26.6	-26.1	-17.2	-17.8	-18.8	-22.5	-25.0	-25.3	-25.0	-24.9	-25.2	-24.7
-24.6	-24.6	-24.4	-24.3	-24.2	-23.7	-23.3	-22.7	-22.3	-23.8	-24.8	-25.2	-25.1	-24.7	-24.4	-24.4	-25.8	-27.0	-25.8	-27.1	-26.7	-25.6	-26.2	-25.8	-24.7	-23.4	-23.1	-22.3	-22.1	-23.8	-23.8	-24.3	-24.7	-24.7	-24.9	-24.9
-24.3	-24.4	-24.0	-24.0	-23.7	-23.3	-23.4	-23.2	-22.5	-21.8	-20.5	-22.5	-24.2	-24.7	-23.8	-23.2	-22.5	-21.7	-21.4	-20.9	-21.4	-20.1	-23.4	-24.3	-24.8	-23.9	-23.5	-22.7	-23.4	-22.8	-23.4	-23.3	-23.1	-23.2	-24.1	-24.5
-25.6	-26.1	-26.0	-25.6	-25.2	-24.7	-24.1	-23.2	-21.8	-20.2	-21.6	-25.3	-27.3	-26.1	-24.5	-24.4	-23.6	-22.7	-22.3	-23.1	-22.6	-21.3	-23.8	-23.9	-23.7	-23.8	-23.8	-23.6	-23.7	-24.0	-24.2	-23.2	-22.1	-23.2	-24.5	-25.6
-24.3	-24.9	-25.1	-25.0	-24.6	-24.3	-23.8	-23.1	-21.7	-19.7	-15.6	-20.4	-26.4	-23.1	-23.9	-23.5	-22.5	-21.5	-20.2	-22.0	-24.1	-22.7	-22.9	-23.6	-23.5	-23.3	-23.4	-23.4	-23.7	-24.7	-24.2	-23.9	-23.7	-24.4	-24.1	-24.2
-20.5	-20.7	-21.0	-21.1	-21.0	-21.0	-20.6	-20.3	-19.5	-18.7	-16.6	-12.3	-18.9	-19.3	-21.0	-20.6	-20.3	-19.5	-18.5	-16.4	-18.2	-21.5	-21.6	-21.3	-20.6	-20.2	-19.7	-20.0	-20.4	-18.4	-18.5	-18.2	-16.7	-21.1	-21.2	-20.6
-15.8	-15.7	-15.9	-15.9	-15.6	-15.3	-14.8	-14.8	-14.7	-14.7	-12.2	-11.1	-13.3	-16.8	-16.2	-15.7	-15.4	-15.0	-15.1	-16.0	-15.5	-17.8	-17.0	-16.3	-15.9	-15.2	-14.6	-14.2	-14.5	-14.8	-13.8	-13.9	-10.8	-17.0	-16.6	-15.6
-11.8	-11.1	-10.7	-10.5	-10.2	-9.8	-9.4	-9.4	-9.4	-9.9	-7.4	-7.8	-9.3	-9.9	-8.1	-7.9	-7.8	-6.9	-7.1	-8.1	-8.6	-8.2	-7.0	-7.7	-8.9	-8.9	-9.2	-9.3	-9.3	-9.6	-10.0	-10.4	-10.8	-11.9	-11.5	-10.2
-6.9	-6.2	-5.5	-5.0	-5.3	-5.7	-5.9	-6.3	-6.3	-6.5	-6.1	-5.5	-4.3	-2.5	-1.2	-1.1	-1.2	-.2	.8	1.8	.8	-1.1	-1.4	-2.0	-2.4	-1.7	-2.3	-3.0	-2.6	-3.1	-4.0	-4.3	-4.1	-5.0	-6.8	-7.0
1.5	1.2	1.3	1.8	1.8	1.2	.8	.2	.5	.3	1.0	4.5	3.6	2.9	2.4	3.0	4.9	8.0	10.4	12.0	11.8	10.8	12.2	14.6	11.5	8.2	11.6	13.7	13.4	11.5	11.3	13.1	10.0	6.2	4.3	2.6
13.8	11.7	10.8	12.4	14.9	15.5	14.8	15.6	18.3	17.1	15.9	19.7	13.6	11.7	11.8	17.0	26.0	36.7	39.3	37.2	34.0	38.1	42.5	46.6	37.4	36.7	43.6	42.8	44.3	45.0	46.2	46.6	43.5	38.1	28.6	16.3
25.7	25.4	25.2	28.1	29.4	29.8	31.4	35.1	39.0	35.7	30.7	27.8	28.2	29.7	32.3	37.8	42.7	46.9	49.3	50.6	52.1	53.5	53.7	53.1	54.1	55.6	56.1	56.6	56.6	55.9	52.8	49.5	45.4	40.5	31.1	26.3

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). **SEPTEMBER 2003**
Channel: HIRS8 (Surface)
NOAA15, using all observations



1.4	1.3	1.4	1.4	1.5	1.6	1.9	2.3	2.9	4.0	5.6	4.2	6.2	6.7	7.2	6.3	3.3	3.4	3.4	3.3	3.1	3.0	2.9	3.0	2.6	2.6	2.7	2.4	2.1	2.0	1.9	1.9	1.9	1.7	1.6	1.5
1.4	1.8	1.3	1.3	1.8	2.8	3.4	2.8	2.8	4.3	4.8	8.3	9.9	6.6	5.8	7.6	2.8	3.2	2.5	4.6	3.7	3.0	2.5	2.4	2.5	2.7	3.3	3.7	4.1	3.7	3.0	2.1	2.2	1.7	.9	1.1
3.1	3.3	4.8	6.0	5.6	6.3	5.8	6.1	5.6	3.9	2.8	2.6	2.4	7.7	10.5	6.9	3.6	1.3	2.5	4.7	4.4	3.4	2.6	2.7	3.6	3.9	4.1	4.7	5.1	5.4	5.8	5.6	4.3	4.5	3.8	3.5
.6	1.2	2.1	1.2	5.1	5.2	6.4	6.7	5.7	4.6	4.3	4.4	2.2	1.8	1.3	1.2	1.3	2.2	3.0	2.4	3.1	3.1	3.9	5.7	6.8	6.6	5.8	4.9	4.9	4.7	4.4	4.2	2.0	2.2	1.8	.7
2.4	2.1	2.3	2.3	1.7	4.1	5.9	6.2	5.6	4.4	3.9	3.1	3.4	3.2	2.0	1.8	1.6	2.6	4.7	5.0	3.9	3.4	5.1	6.1	6.8	7.4	8.0	7.1	5.6	4.3	4.1	4.3	2.5	3.2	2.7	2.4
1.8	1.9	1.8	1.4	1.3	2.3	5.1	5.0	4.4	4.0	3.1	1.8	1.3	1.5	1.6	1.5	1.4	3.7	4.4	2.6	3.2	3.1	7.3	5.0	6.2	10.1	9.1	5.6	5.5	3.5	3.9	3.0	2.8	2.0	2.0	2.0
1.4	1.2	1.1	.9	.8	1.1	2.2	3.6	2.5	1.8	1.5	1.4	1.5	1.5	1.4	1.3	3.9	3.5	4.2	3.4	3.4	3.3	3.7	4.5	3.6	2.9	7.1	5.5	3.5	2.4	1.9	1.5	1.5	1.7	1.5	1.5
1.6	1.6	1.6	1.5	1.5	1.7	1.6	2.1	2.7	2.1	1.8	1.6	1.5	1.6	1.6	1.8	3.4	4.1	3.6	4.0	4.5	5.4	3.4	2.7	1.3	1.9	1.7	1.6	1.7	1.8	1.8	1.7	1.7	1.7	1.5	1.6
1.8	1.7	1.7	1.7	1.7	1.5	1.2	1.3	1.4	1.2	2.5	2.1	1.8	1.5	1.7	1.7	1.6	1.6	1.5	1.9	1.7	3.1	2.9	1.3	1.5	1.5	1.6	1.8	1.6	1.9	1.6	1.5	1.4	1.4	1.7	1.7
1.8	1.4	1.2	.9	.9	.9	.9	.9	1.0	1.1	4.2	2.8	3.3	2.9	2.0	.9	.8	.8	.8	2.6	3.0	3.3	1.1	1.5	1.6	1.8	1.7	1.8	1.9	1.8	1.8	2.4	2.5	1.8	1.9	1.8
1.7	1.7	1.6	1.4	1.1	1.1	.9	.8	.7	.7	5.7	8.8	4.7	4.3	1.7	.8	.9	.8	1.0	4.3	4.3	3.6	2.8	1.1	1.2	1.1	1.3	1.2	1.1	1.1	2.6	3.2	2.9	1.2	1.3	1.6
1.8	1.9	1.9	2.0	2.0	1.9	1.8	1.5	1.2	.9	2.2	9.8	5.6	2.8	1.7	1.6	1.3	1.1	.8	3.8	5.6	3.3	2.6	1.4	1.5	1.3	1.3	1.5	1.5	4.0	5.2	5.6	5.6	8.8	1.6	1.7
1.5	1.8	1.8	1.8	1.7	1.9	2.0	2.0	1.8	1.6	4.1	5.5	3.6	1.4	1.7	1.8	1.9	2.2	2.0	2.0	3.8	1.8	1.7	1.6	1.4	1.5	1.7	1.7	1.8	2.6	2.2	3.4	4.3	3.1	1.7	2.4
1.6	1.1	1.1	1.2	1.4	1.4	1.2	1.2	1.4	1.4	4.8	3.3	1.9	2.4	2.7	2.7	2.8	2.7	2.2	3.1	3.7	3.0	2.9	3.3	3.6	3.4	2.4	1.9	2.0	1.7	1.3	1.3	2.0	1.8	2.6	2.6
1.9	2.2	2.7	2.8	2.2	1.6	1.3	1.2	1.0	1.0	2.1	1.8	2.1	1.7	1.3	1.6	1.8	2.2	3.6	4.3	3.8	2.4	1.6	1.2	1.1	1.5	1.7	1.5	1.4	1.1	1.6	1.8	2.3	2.6	2.1	1.4
4.4	3.6	3.0	3.2	3.3	3.5	3.8	3.5	3.9	3.9	4.5	8.0	5.9	5.1	4.0	4.1	5.3	6.2	5.3	4.6	4.5	5.2	9.9	13.5	11.0	6.4	11.2	12.9	12.8	12.1	13.5	15.0	11.8	8.0	5.5	5.4
6.9	7.1	7.4	9.7	11.7	11.7	11.2	11.7	12.1	12.3	10.2	8.4	7.2	7.3	7.6	11.5	13.5	12.9	12.0	12.2	13.5	10.4	8.5	6.5	8.7	9.0	7.3	7.9	9.2	9.0	7.7	6.3	7.3	8.0	10.2	5.5
10.1	9.4	9.5	9.3	9.0	9.0	8.4	9.0	8.9	6.6	8.2	9.4	10.9	11.2	11.0	9.5	8.3	7.2	5.6	4.4	4.0	4.0	4.8	5.4	4.7	4.1	3.9	3.7	3.9	5.0	5.5	5.9	6.4	7.5	11.8	11.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

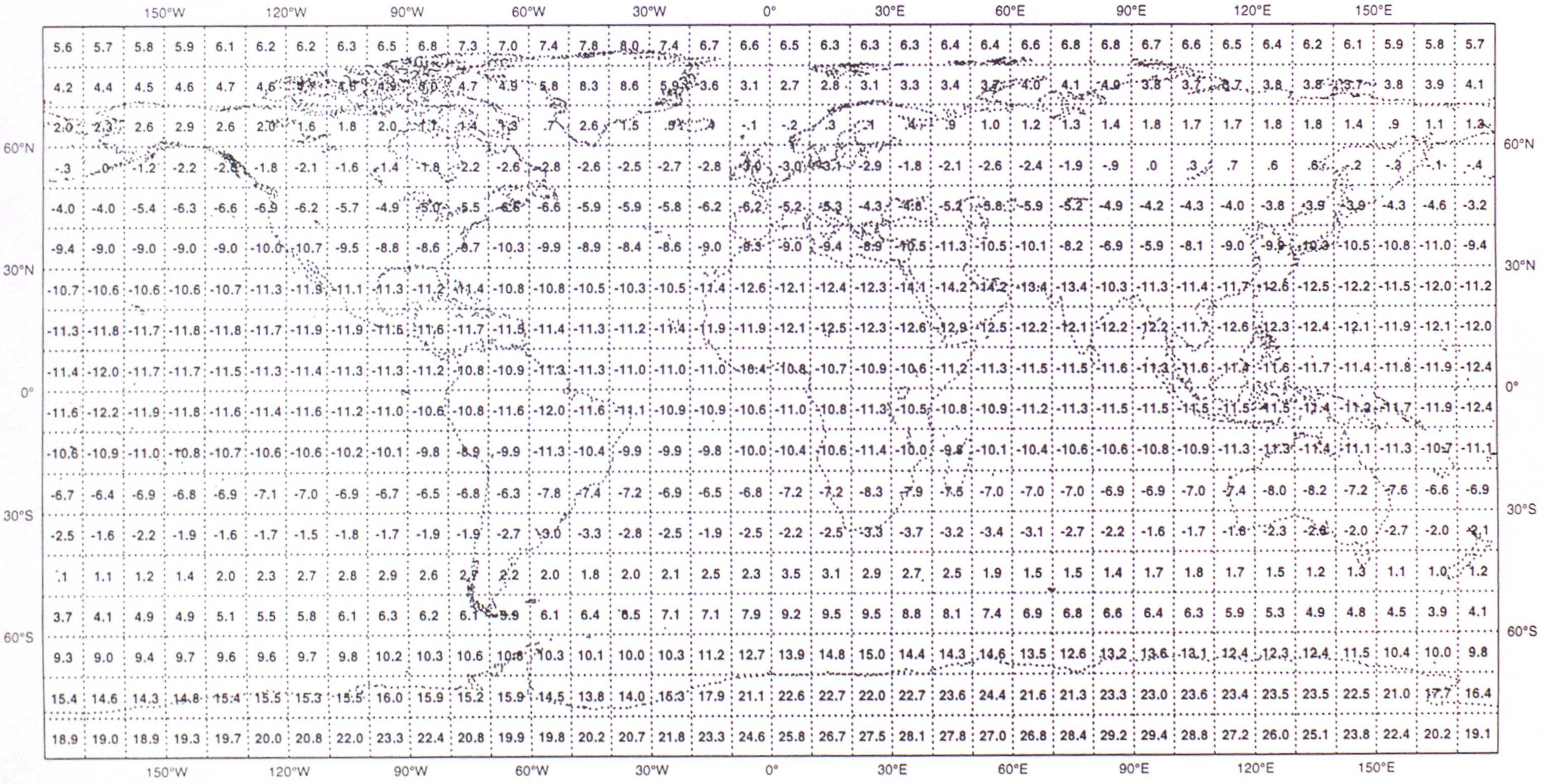
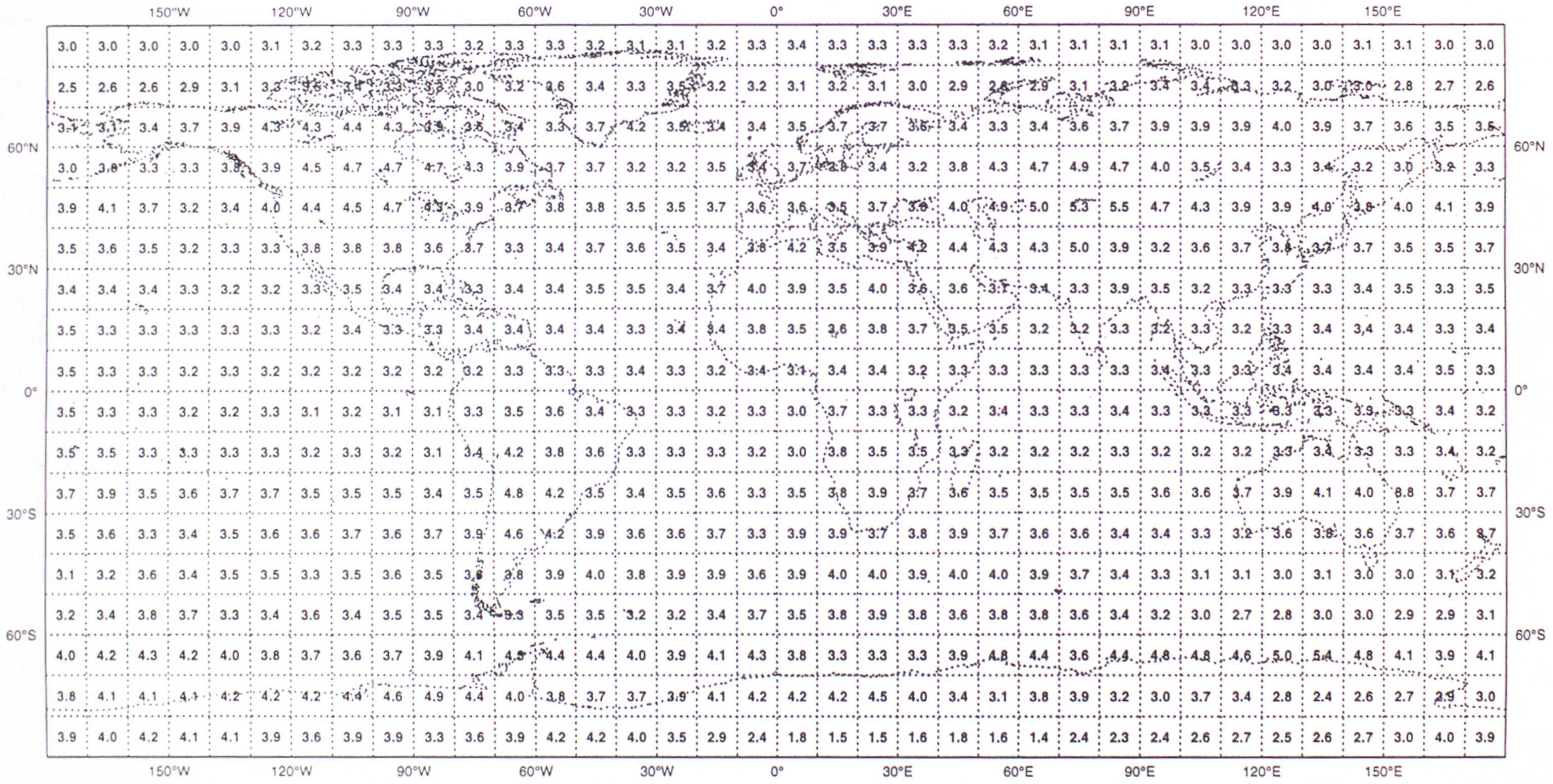
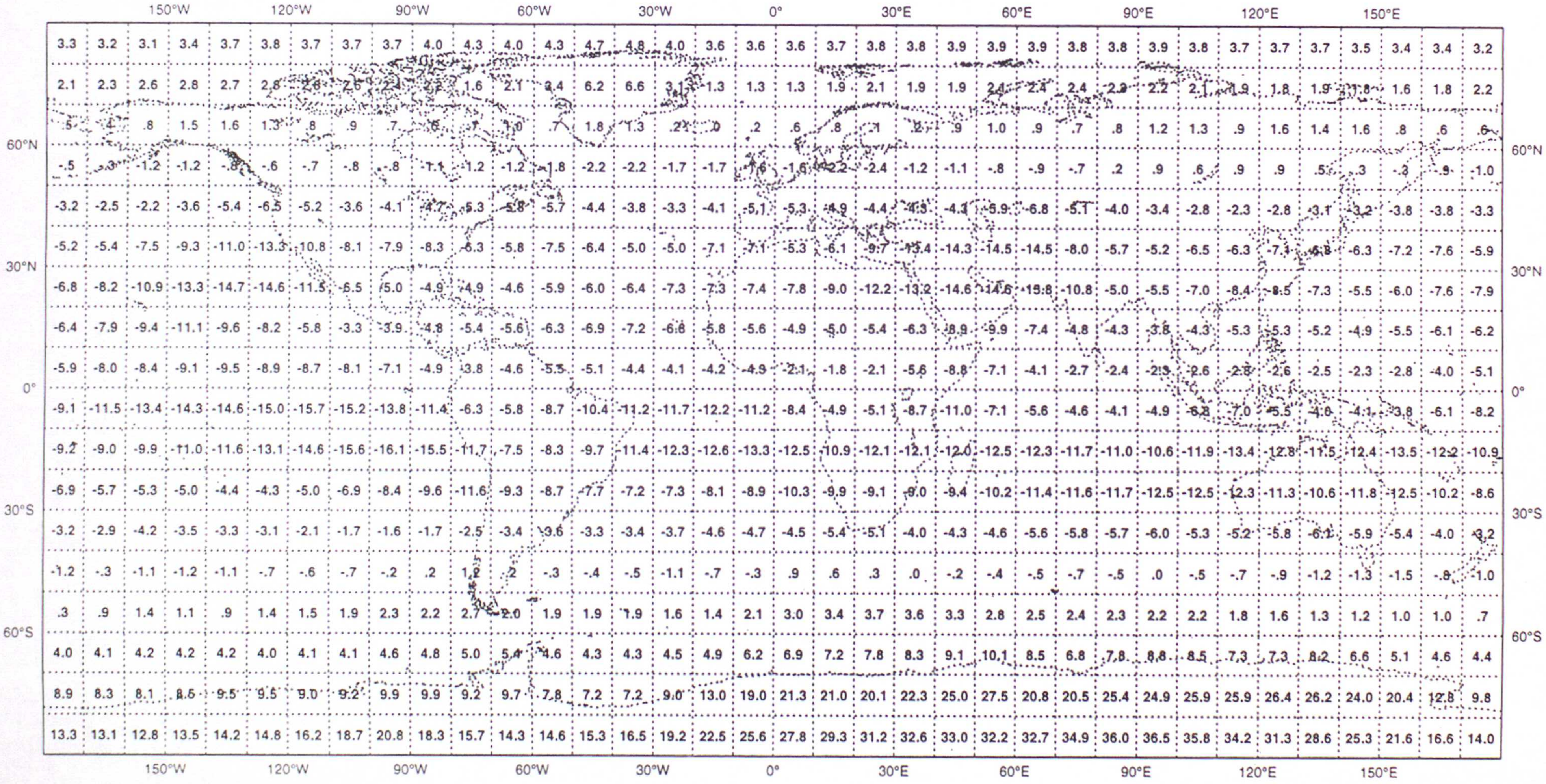

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5.6 5.7 5.8 5.9 6.1 6.2 6.2 6.3 6.5 6.8 7.3 7.0 7.4 7.8 8.0 7.4 6.7 6.6 6.5 6.3 6.3 6.3 6.4 6.4 6.6 6.8 6.8 6.7 6.6 6.5 6.4 6.2 6.1 5.9 5.8 5.7
4.2 4.4 4.5 4.6 4.7 4.6 4.8 4.9 5.0 4.7 4.9 5.8 8.3 8.6 5.9 3.6 3.1 2.7 2.8 3.1 3.3 3.4 3.7 4.0 4.1 4.9 3.8 3.7 3.7 3.8 3.8 3.7 3.8 3.9 4.1
2.0 2.3 2.6 2.9 2.6 2.0 1.6 1.8 2.0 1.7 1.4 1.3 .7 2.6 1.5 .5 .4 -.1 -.2 .3 .1 .4 .9 1.0 1.2 1.3 1.4 1.8 1.7 1.7 1.8 1.8 1.4 .9 1.1 1.3
-.3 -.0 -1.2 -2.2 -2.8 -1.8 -2.1 -1.6 -1.4 -1.8 -2.2 -2.6 -2.8 -2.6 -2.5 -2.7 -2.8 -3.0 -3.0 -3.1 -2.9 -1.8 -2.1 -2.6 -2.4 -1.9 -.9 .0 .3 .7 .6 .6 -.2 -.3 -.1 -.4
-4.0 -4.0 -5.4 -6.3 -6.6 -6.9 -6.2 -5.7 -4.9 -5.0 -5.5 -6.6 -6.6 -5.9 -5.9 -5.8 -6.2 -6.2 -5.2 -5.3 -4.3 -4.8 -5.2 -5.8 -5.9 -5.2 -4.9 -4.2 -4.3 -4.0 -3.8 -3.9 -3.9 -4.3 -4.6 -3.2
-9.4 -9.0 -9.0 -9.0 -9.0 -10.0 -10.7 -9.5 -8.8 -8.6 -8.7 -10.3 -9.9 -8.9 -8.4 -8.6 -9.0 -8.3 -9.0 -9.4 -8.9 -10.5 -11.3 -10.5 -10.1 -8.2 -6.9 -5.9 -8.1 -9.0 -9.9 -10.3 -10.5 -10.8 -11.0 -9.4
-10.7 -10.6 -10.6 -10.6 -10.7 -11.3 -11.9 -11.1 -11.3 -11.2 -11.4 -10.8 -10.8 -10.5 -10.3 -10.5 -11.4 -12.6 -12.1 -12.4 -12.3 -14.1 -14.2 -14.2 -13.4 -13.4 -10.3 -11.3 -11.4 -11.7 -12.6 -12.5 -12.2 -11.5 -12.0 -11.2
-11.3 -11.8 -11.7 -11.8 -11.8 -11.7 -11.9 -11.9 -11.5 -11.6 -11.7 -11.5 -11.4 -11.3 -11.2 -11.4 -11.9 -11.9 -12.1 -12.5 -12.3 -12.6 -12.9 -12.5 -12.2 -12.1 -12.2 -12.2 -11.7 -12.6 -12.3 -12.4 -12.1 -11.9 -12.1 -12.0
-11.4 -12.0 -11.7 -11.7 -11.5 -11.3 -11.4 -11.3 -11.3 -11.2 -10.8 -10.9 -11.3 -11.3 -11.0 -11.0 -11.0 -10.4 -10.8 -10.7 -10.9 -10.6 -11.2 -11.3 -11.5 -11.5 -11.6 -11.3 -11.6 -11.4 -11.6 -11.7 -11.4 -11.8 -11.9 -12.4
-11.6 -12.2 -11.9 -11.8 -11.6 -11.4 -11.6 -11.2 -11.0 -10.6 -10.8 -11.6 -12.0 -11.6 -11.1 -10.9 -10.9 -10.6 -11.0 -10.8 -11.3 -10.5 -10.8 -10.9 -11.2 -11.3 -11.5 -11.5 -11.5 -11.5 -11.5 -11.4 -11.2 -11.7 -11.9 -12.4
-10.6 -10.9 -11.0 -10.8 -10.7 -10.6 -10.6 -10.2 -10.1 -9.8 -8.9 -9.9 -11.3 -10.4 -9.9 -9.9 -9.8 -10.0 -10.4 -10.6 -11.4 -10.0 -9.8 -10.1 -10.4 -10.6 -10.6 -10.8 -10.9 -11.3 -11.3 -11.4 -11.1 -11.3 -10.7 -11.1
-6.7 -6.4 -6.9 -6.8 -6.9 -7.1 -7.0 -6.9 -6.7 -6.5 -6.8 -6.3 -7.8 -7.4 -7.2 -6.9 -6.5 -6.8 -7.2 -7.2 -8.3 -7.9 -7.5 -7.0 -7.0 -7.0 -6.9 -6.9 -7.0 -7.4 -8.0 -8.2 -7.2 -7.6 -6.6 -6.9
-2.5 -1.6 -2.2 -1.9 -1.6 -1.7 -1.5 -1.8 -1.7 -1.9 -1.9 -2.7 -3.0 -3.3 -2.8 -2.5 -1.9 -2.5 -2.2 -2.5 -3.3 -3.7 -3.2 -3.4 -3.1 -2.7 -2.2 -1.6 -1.7 -1.8 -2.3 -2.6 -2.0 -2.7 -2.0 -2.1
.1 1.1 1.2 1.4 2.0 2.3 2.7 2.8 2.9 2.6 2.7 2.2 2.0 1.8 2.0 2.1 2.5 2.3 3.5 3.1 2.9 2.7 2.5 1.9 1.5 1.5 1.4 1.7 1.8 1.7 1.5 1.2 1.3 1.1 1.0 1.2
3.7 4.1 4.9 4.9 5.1 5.5 5.8 6.1 6.3 6.2 6.1 5.9 6.1 6.4 6.5 7.1 7.1 7.9 9.2 9.5 9.5 8.8 8.1 7.4 6.9 6.8 6.6 6.4 6.3 5.9 5.3 4.9 4.8 4.5 3.9 4.1
9.3 9.0 9.4 9.7 9.6 9.6 9.7 9.8 10.2 10.3 10.6 10.8 10.3 10.1 10.0 10.3 11.2 12.7 13.9 14.8 15.0 14.4 14.3 14.6 13.5 12.6 13.2 13.6 13.1 12.4 12.3 12.4 11.5 10.4 10.0 9.8
15.4 14.6 14.3 14.8 15.4 15.5 15.3 15.5 16.0 15.9 15.2 15.9 14.5 13.8 14.0 16.3 17.9 21.1 22.6 22.7 22.0 22.7 23.6 24.4 21.6 21.3 23.3 23.0 23.6 23.4 23.5 23.5 22.5 21.0 17.7 16.4
18.9 19.0 18.9 19.3 19.7 20.0 20.8 22.0 23.3 22.4 20.8 19.9 19.8 20.2 20.7 21.8 23.3 24.6 25.8 26.7 27.5 28.1 27.8 27.0 26.8 28.4 29.2 29.4 28.8 27.2 26.0 25.1 23.8 22.4 20.2 19.1

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



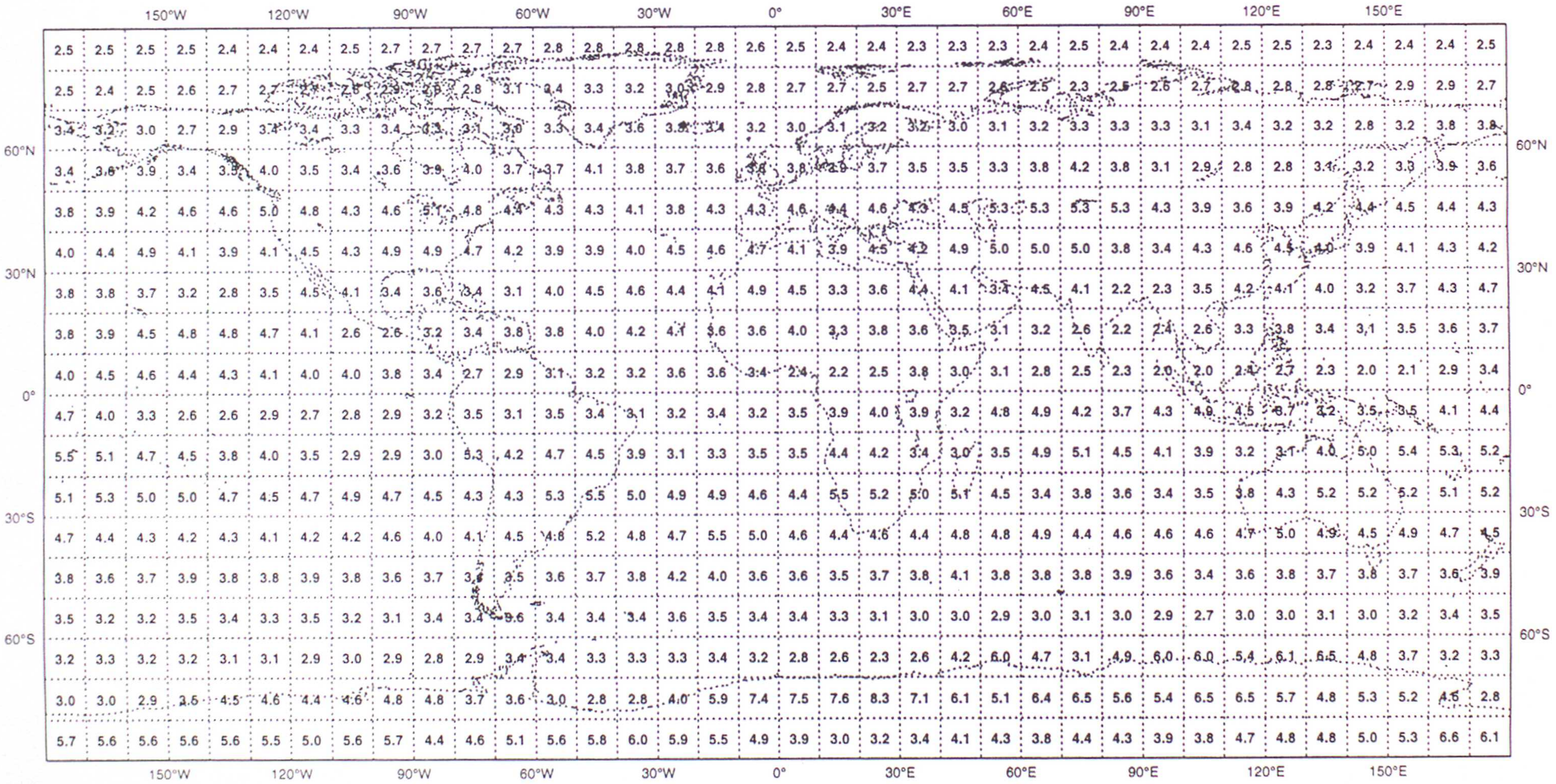
3.0	3.0	3.0	3.0	3.0	3.1	3.2	3.3	3.3	3.3	3.2	3.3	3.3	3.2	3.1	3.1	3.2	3.3	3.4	3.3	3.3	3.3	3.3	3.2	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.1	3.1	3.0	3.0
2.5	2.6	2.6	2.9	3.1	3.3	3.6	3.4	3.3	3.3	3.0	3.2	3.6	3.4	3.3	3.5	3.2	3.2	3.1	3.2	3.1	3.0	2.9	2.8	2.9	3.1	3.2	3.4	3.4	3.3	3.2	3.0	3.0	2.8	2.7	2.6
3.1	3.1	3.4	3.7	3.9	4.3	4.3	4.4	4.3	3.9	3.6	3.4	3.3	3.7	4.2	3.5	3.4	3.4	3.5	3.7	3.7	3.6	3.4	3.3	3.4	3.6	3.7	3.9	3.9	3.9	4.0	3.9	3.7	3.6	3.5	3.5
3.0	3.8	3.3	3.3	3.8	3.9	4.5	4.7	4.7	4.7	4.3	3.9	3.7	3.7	3.2	3.2	3.5	3.4	3.7	3.8	3.4	3.2	3.8	4.3	4.7	4.9	4.7	4.0	3.5	3.4	3.3	3.4	3.2	3.0	3.2	3.3
3.9	4.1	3.7	3.2	3.4	4.0	4.4	4.5	4.7	4.3	3.9	3.7	3.8	3.8	3.5	3.5	3.7	3.6	3.6	3.5	3.7	3.8	4.0	4.9	5.0	5.3	5.5	4.7	4.3	3.9	3.9	4.0	3.8	4.0	4.1	3.9
3.5	3.6	3.5	3.2	3.3	3.3	3.8	3.8	3.8	3.6	3.7	3.3	3.4	3.7	3.6	3.5	3.4	3.8	4.2	3.5	3.9	4.2	4.4	4.3	4.3	5.0	3.9	3.2	3.6	3.7	3.8	3.7	3.7	3.5	3.5	3.7
3.4	3.4	3.4	3.3	3.2	3.2	3.3	3.5	3.4	3.4	3.3	3.4	3.4	3.5	3.5	3.4	3.7	4.0	3.9	3.5	4.0	3.6	3.6	3.7	3.4	3.3	3.9	3.5	3.2	3.3	3.3	3.3	3.4	3.5	3.3	3.5
3.5	3.3	3.3	3.3	3.3	3.3	3.2	3.4	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.4	3.4	3.8	3.5	3.6	3.8	3.7	3.5	3.5	3.2	3.2	3.3	3.2	3.3	3.2	3.3	3.4	3.4	3.4	3.3	3.4
3.5	3.3	3.3	3.2	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.3	3.2	3.4	3.1	3.4	3.4	3.2	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.3	3.4	3.4	3.4	3.4	3.5	3.3
3.5	3.3	3.3	3.2	3.2	3.3	3.1	3.2	3.1	3.1	3.3	3.5	3.6	3.4	3.3	3.3	3.2	3.3	3.0	3.7	3.3	3.3	3.2	3.4	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.9	3.3	3.4	3.2
3.5	3.5	3.3	3.3	3.3	3.3	3.2	3.3	3.2	3.1	3.4	4.2	3.8	3.6	3.3	3.3	3.3	3.2	3.0	3.8	3.5	3.5	3.3	3.2	3.2	3.2	3.3	3.2	3.2	3.2	3.3	3.4	3.3	3.3	3.4	3.2
3.7	3.9	3.5	3.6	3.7	3.7	3.5	3.5	3.5	3.4	3.5	4.8	4.2	3.5	3.4	3.5	3.6	3.3	3.5	3.8	3.9	3.7	3.6	3.5	3.5	3.5	3.5	3.6	3.6	3.7	3.9	4.1	4.0	3.8	3.7	3.7
3.5	3.6	3.3	3.4	3.5	3.6	3.6	3.7	3.6	3.7	3.9	4.6	4.2	3.9	3.6	3.6	3.7	3.3	3.9	3.9	3.7	3.8	3.9	3.7	3.6	3.6	3.4	3.4	3.3	3.2	3.6	3.8	3.6	3.7	3.6	3.7
3.1	3.2	3.6	3.4	3.5	3.5	3.3	3.5	3.6	3.5	3.6	3.8	3.9	4.0	3.8	3.9	3.9	3.6	3.9	4.0	4.0	3.9	4.0	4.0	3.9	3.7	3.4	3.3	3.1	3.1	3.0	3.1	3.0	3.0	3.1	3.2
3.2	3.4	3.8	3.7	3.3	3.4	3.6	3.4	3.5	3.5	3.4	3.3	3.5	3.5	3.2	3.2	3.4	3.7	3.5	3.8	3.9	3.8	3.6	3.8	3.8	3.6	3.4	3.2	3.0	2.7	2.8	3.0	3.0	2.9	2.9	3.1
4.0	4.2	4.3	4.2	4.0	3.8	3.7	3.6	3.7	3.9	4.1	4.5	4.4	4.4	4.0	3.9	4.1	4.3	3.8	3.3	3.3	3.3	3.9	4.8	4.4	3.6	4.4	4.8	4.8	4.6	5.0	5.4	4.8	4.1	3.9	4.1
3.8	4.1	4.1	4.1	4.2	4.2	4.2	4.4	4.6	4.9	4.4	4.0	3.8	3.7	3.7	3.9	4.1	4.2	4.2	4.2	4.5	4.0	3.4	3.1	3.8	3.9	3.2	3.0	3.7	3.4	2.8	2.4	2.6	2.7	2.9	3.0
3.9	4.0	4.2	4.1	4.1	3.9	3.6	3.9	3.9	3.3	3.6	3.9	4.2	4.2	4.0	3.5	2.9	2.4	1.8	1.5	1.5	1.6	1.8	1.6	1.4	2.4	2.3	2.4	2.6	2.7	2.5	2.6	2.7	3.0	4.0	3.9

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



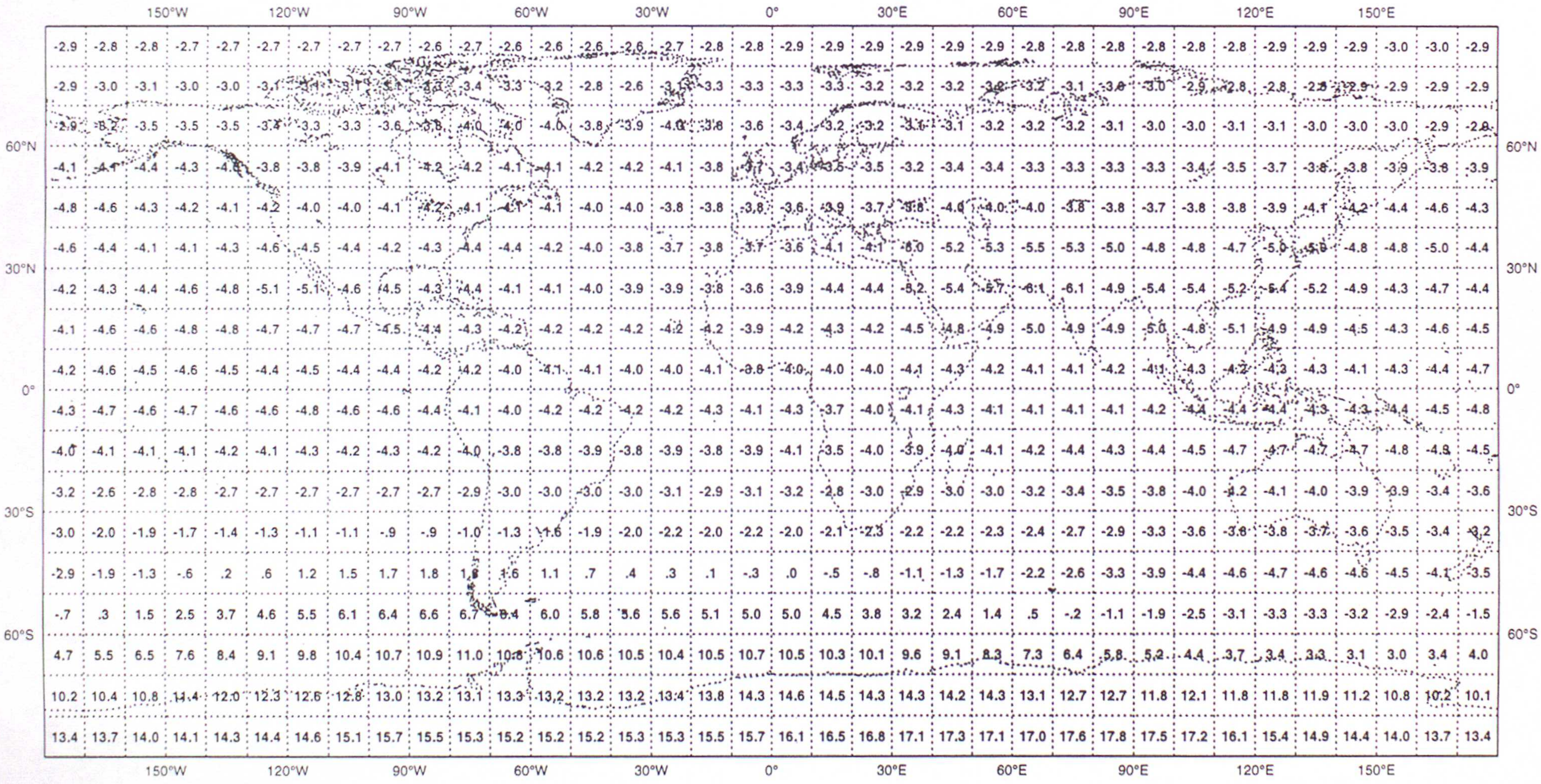
3.3	3.2	3.1	3.4	3.7	3.8	3.7	3.7	3.7	4.0	4.3	4.0	4.3	4.7	4.8	4.0	3.6	3.6	3.6	3.7	3.8	3.8	3.9	3.9	3.9	3.8	3.8	3.9	3.8	3.7	3.7	3.7	3.5	3.4	3.4	3.2
2.1	2.3	2.6	2.8	2.7	2.8	2.8	2.6	2.4	2.2	1.6	2.1	3.4	6.2	6.6	3.1	1.3	1.3	1.3	1.9	2.1	1.9	1.9	2.4	2.4	2.4	2.3	2.2	2.1	1.9	1.8	1.9	1.8	1.6	1.8	2.2
.5	.4	.8	1.5	1.6	1.3	.8	.9	.7	.6	.7	1.0	.7	1.8	1.3	.2	.0	.2	.6	.8	.1	.2	.9	1.0	.9	.7	.8	1.2	1.3	.9	1.6	1.4	1.6	.8	.6	.6
-.5	-.3	-1.2	-1.2	-.8	-.6	-.7	-.8	-.8	-1.1	-1.2	-1.2	-1.8	-2.2	-2.2	-1.7	-1.7	-1.6	-1.6	-2.2	-2.4	-1.2	-1.1	-.8	-.9	-.7	.2	.9	.6	.9	.9	.5	.3	-.3	-.9	-1.0
-3.2	-2.5	-2.2	-3.6	-5.4	-6.5	-5.2	-3.6	-4.1	-4.7	-5.3	-5.8	-5.7	-4.4	-3.8	-3.3	-4.1	-5.1	-5.3	-4.9	-4.4	-4.3	-4.1	-5.9	-6.8	-5.1	-4.0	-3.4	-2.8	-2.3	-2.8	-3.1	-3.2	-3.8	-3.8	-3.3
-5.2	-5.4	-7.5	-9.3	-11.0	-13.3	-10.8	-8.1	-7.9	-8.3	-6.3	-5.8	-7.5	-6.4	-5.0	-5.0	-7.1	-7.1	-5.3	-6.1	-9.7	-13.4	-14.3	-14.5	-14.5	-8.0	-5.7	-5.2	-6.5	-6.3	-7.1	-6.8	-6.3	-7.2	-7.6	-5.9
-6.8	-8.2	-10.9	-13.3	-14.7	-14.6	-11.5	-6.5	-5.0	-4.9	-4.9	-4.6	-5.9	-6.0	-6.4	-7.3	-7.3	-7.4	-7.8	-9.0	-12.2	-13.2	-14.6	-14.6	-15.8	-10.8	-5.0	-5.5	-7.0	-8.4	-8.5	-7.3	-5.5	-6.0	-7.6	-7.9
-6.4	-7.9	-9.4	-11.1	-9.6	-8.2	-5.8	-3.3	-3.9	-4.8	-5.4	-5.6	-6.3	-6.9	-7.2	-6.8	-5.8	-5.6	-4.9	-5.0	-5.4	-6.3	-8.9	-9.9	-7.4	-4.8	-4.3	-3.8	-4.3	-5.3	-5.3	-5.2	-4.9	-5.5	-6.1	-6.2
-5.9	-8.0	-8.4	-9.1	-9.5	-8.9	-8.7	-8.1	-7.1	-4.9	-3.8	-4.6	-5.5	-5.1	-4.4	-4.1	-4.2	-4.9	-2.1	-1.8	-2.1	-5.6	-8.8	-7.1	-4.1	-2.7	-2.4	-2.3	-2.6	-2.8	-2.6	-2.5	-2.3	-2.8	-4.0	-5.1
-9.1	-11.5	-13.4	-14.3	-14.6	-15.0	-15.7	-15.2	-13.8	-11.4	-6.3	-5.8	-8.7	-10.4	-11.2	-11.7	-12.2	-11.2	-8.4	-4.9	-5.1	-8.7	-11.0	-7.1	-5.6	-4.6	-4.1	-4.9	-6.8	-7.0	-5.5	-4.0	-4.1	-3.8	-6.1	-8.2
-9.2	-9.0	-9.9	-11.0	-11.6	-13.1	-14.6	-15.6	-16.1	-15.5	-11.7	-7.5	-8.3	-9.7	-11.4	-12.3	-12.6	-13.3	-12.5	-10.9	-12.1	-12.1	-12.0	-12.5	-12.3	-11.7	-11.0	-10.6	-11.9	-13.4	-12.8	-11.5	-12.4	-13.5	-12.2	-10.9
-6.9	-5.7	-5.3	-5.0	-4.4	-4.3	-5.0	-6.9	-8.4	-9.6	-11.6	-9.3	-8.7	-7.7	-7.2	-7.3	-8.1	-8.9	-10.3	-9.9	-9.1	-9.0	-9.4	-10.2	-11.4	-11.6	-11.7	-12.5	-12.5	-12.3	-11.3	-10.6	-11.8	-12.5	-10.2	-8.6
-3.2	-2.9	-4.2	-3.5	-3.3	-3.1	-2.1	-1.7	-1.6	-1.7	-2.5	-3.4	-3.6	-3.3	-3.4	-3.7	-4.6	-4.7	-4.5	-5.4	-5.1	-4.0	-4.3	-4.6	-5.6	-5.8	-5.7	-6.0	-5.3	-5.2	-5.8	-6.1	-5.9	-5.4	-4.0	-3.2
-1.2	-.3	-1.1	-1.2	-1.1	-.7	-.6	-.7	-.2	.2	1.2	.2	-.3	-.4	-.5	-1.1	-.7	-.3	.9	.6	.3	.0	-.2	-.4	-.5	-.7	-.5	.0	-.5	-.7	-.9	-1.2	-1.3	-1.5	-.8	-1.0
.3	.9	1.4	1.1	.9	1.4	1.5	1.9	2.3	2.2	2.7	2.0	1.9	1.9	1.9	1.6	1.4	2.1	3.0	3.4	3.7	3.6	3.3	2.8	2.5	2.4	2.3	2.2	2.2	1.8	1.6	1.3	1.2	1.0	1.0	.7
4.0	4.1	4.2	4.2	4.2	4.0	4.1	4.1	4.6	4.8	5.0	5.4	4.6	4.3	4.3	4.5	4.9	6.2	6.9	7.2	7.8	8.3	9.1	10.1	8.5	6.8	7.8	8.8	8.5	7.3	7.3	8.2	6.6	5.1	4.6	4.4
8.9	8.3	8.1	8.5	9.5	9.5	9.0	9.2	9.9	9.9	9.2	9.7	7.8	7.2	7.2	9.0	13.0	19.0	21.3	21.0	20.1	22.3	25.0	27.5	20.8	20.5	25.4	24.9	25.9	25.9	26.4	26.2	24.0	20.4	12.8	9.8
13.3	13.1	12.8	13.5	14.2	14.8	16.2	18.7	20.8	18.3	15.7	14.3	14.6	15.3	16.5	19.2	22.5	25.6	27.8	29.3	31.2	32.6	33.0	32.2	32.7	34.9	36.0	36.5	35.8	34.2	31.3	28.6	25.3	21.6	16.6	14.0

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



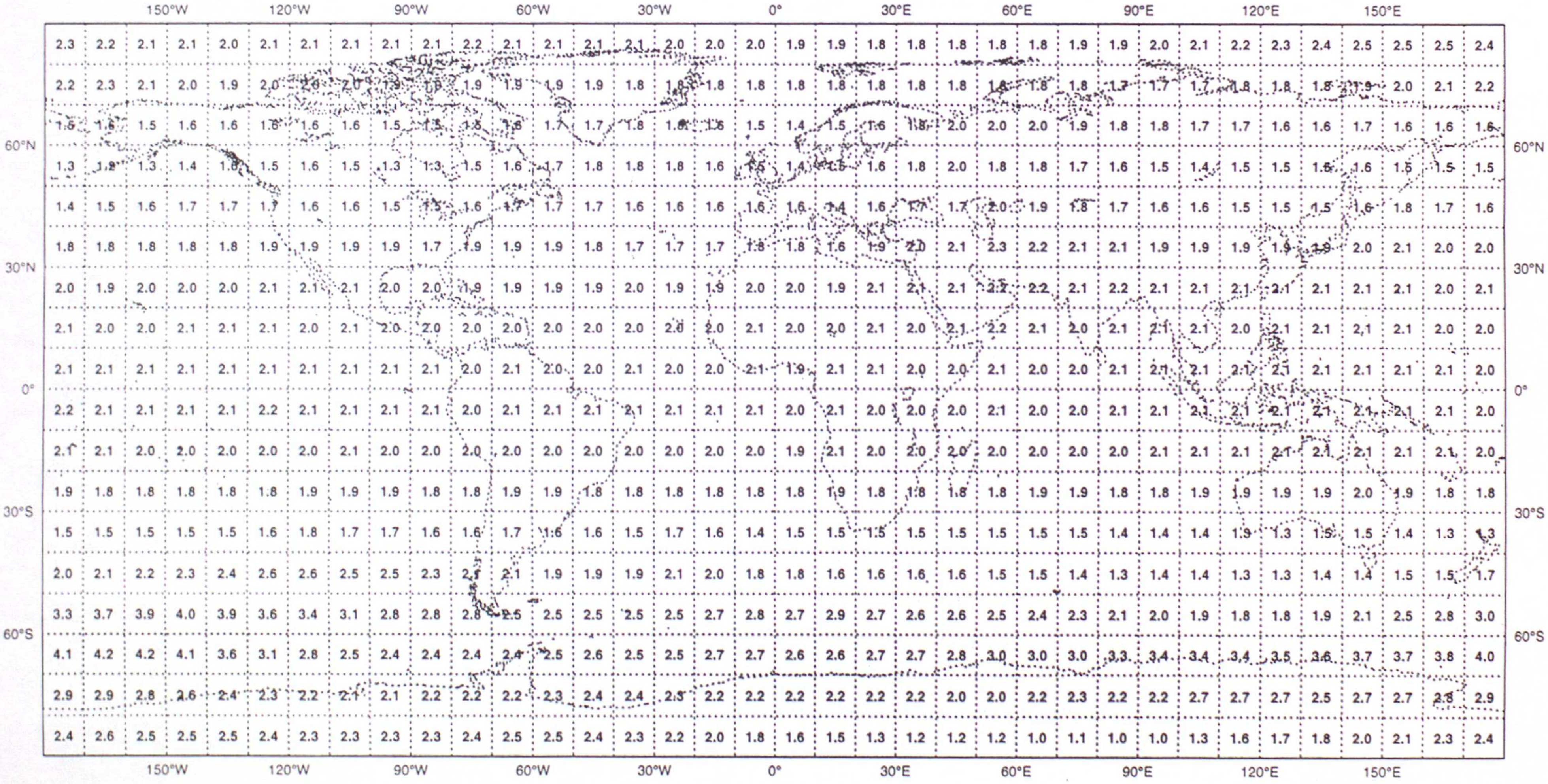
2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.4	2.5	2.5	2.3	2.4	2.4	2.4	2.5
2.5	2.4	2.5	2.6	2.7	2.7	2.7	2.8	2.9	2.9	2.8	3.1	3.4	3.3	3.2	3.0	2.9	2.8	2.7	2.7	2.5	2.7	2.7	2.6	2.5	2.3	2.5	2.6	2.7	2.8	2.8	2.8	2.7	2.9	2.9	2.7
3.4	3.2	3.0	2.7	2.9	3.4	3.4	3.3	3.4	3.3	3.1	3.0	3.3	3.4	3.6	3.8	3.4	3.2	3.0	3.1	3.2	3.2	3.0	3.1	3.2	3.3	3.3	3.3	3.1	3.4	3.2	3.2	2.8	3.2	3.8	3.8
3.4	3.6	3.9	3.4	3.5	4.0	3.5	3.4	3.6	3.9	4.0	3.7	3.7	4.1	3.8	3.7	3.6	3.6	3.8	2.9	3.7	3.5	3.5	3.3	3.8	4.2	3.8	3.1	2.9	2.8	2.8	3.4	3.2	3.3	3.9	3.6
3.8	3.9	4.2	4.6	4.6	5.0	4.8	4.3	4.6	5.1	4.8	4.4	4.3	4.3	4.1	3.8	4.3	4.3	4.6	4.4	4.6	4.3	4.5	5.3	5.3	5.3	5.3	4.3	3.9	3.6	3.9	4.2	4.4	4.5	4.4	4.3
4.0	4.4	4.9	4.1	3.9	4.1	4.5	4.3	4.9	4.9	4.7	4.2	3.9	3.9	4.0	4.5	4.6	4.7	4.1	3.9	4.5	4.2	4.9	5.0	5.0	5.0	3.8	3.4	4.3	4.6	4.5	4.0	3.9	4.1	4.3	4.2
3.8	3.8	3.7	3.2	2.8	3.5	4.5	4.1	3.4	3.6	3.4	3.1	4.0	4.5	4.6	4.4	4.1	4.9	4.5	3.3	3.6	4.4	4.1	3.4	4.5	4.1	2.2	2.3	3.5	4.2	4.1	4.0	3.2	3.7	4.3	4.7
3.8	3.9	4.5	4.8	4.8	4.7	4.1	2.6	2.6	3.2	3.4	3.8	3.8	4.0	4.2	4.1	3.6	3.6	4.0	3.3	3.8	3.6	3.5	3.1	3.2	2.6	2.2	2.4	2.6	3.3	3.8	3.4	3.1	3.5	3.6	3.7
4.0	4.5	4.6	4.4	4.3	4.1	4.0	4.0	3.8	3.4	2.7	2.9	3.1	3.2	3.2	3.6	3.6	3.4	2.4	2.2	2.5	3.8	3.0	3.1	2.8	2.5	2.3	2.0	2.0	2.4	2.7	2.3	2.0	2.1	2.9	3.4
4.7	4.0	3.3	2.6	2.6	2.9	2.7	2.8	2.9	3.2	3.5	3.1	3.5	3.4	3.1	3.2	3.4	3.2	3.5	3.9	4.0	3.9	3.2	4.8	4.9	4.2	3.7	4.3	4.9	4.5	6.7	3.2	3.5	3.5	4.1	4.4
5.5	5.1	4.7	4.5	3.8	4.0	3.5	2.9	2.9	3.0	5.3	4.2	4.7	4.5	3.9	3.1	3.3	3.5	3.5	4.4	4.2	3.4	3.0	3.5	4.9	5.1	4.5	4.1	3.9	3.2	3.1	4.0	5.0	5.4	5.3	5.2
5.1	5.3	5.0	5.0	4.7	4.5	4.7	4.9	4.7	4.5	4.3	4.3	5.3	5.5	5.0	4.9	4.9	4.6	4.4	5.5	5.2	5.0	5.1	4.5	3.4	3.8	3.6	3.4	3.5	3.8	4.3	5.2	5.2	5.2	5.1	5.2
4.7	4.4	4.3	4.2	4.3	4.1	4.2	4.2	4.6	4.0	4.1	4.5	4.8	5.2	4.8	4.7	5.5	5.0	4.6	4.4	4.6	4.4	4.8	4.8	4.9	4.4	4.6	4.6	4.6	4.7	5.0	4.9	4.5	4.9	4.7	4.5
3.8	3.6	3.7	3.9	3.8	3.8	3.9	3.8	3.6	3.7	3.6	3.5	3.6	3.7	3.8	4.2	4.0	3.6	3.6	3.5	3.7	3.8	4.1	3.8	3.8	3.8	3.9	3.6	3.4	3.6	3.8	3.7	3.8	3.7	3.6	3.9
3.5	3.2	3.2	3.5	3.4	3.3	3.5	3.2	3.1	3.4	3.4	3.6	3.4	3.4	3.4	3.6	3.5	3.4	3.4	3.3	3.1	3.0	3.0	2.9	3.0	3.1	3.0	2.9	2.7	3.0	3.0	3.1	3.0	3.2	3.4	3.5
3.2	3.3	3.2	3.2	3.1	3.1	2.9	3.0	2.9	2.8	2.9	3.4	3.4	3.3	3.3	3.3	3.4	3.2	2.8	2.6	2.3	2.6	4.2	6.0	4.7	3.1	4.9	6.0	6.0	5.4	6.1	6.5	4.8	3.7	3.2	3.3
3.0	3.0	2.9	3.5	4.5	4.6	4.4	4.6	4.8	4.8	3.7	3.6	3.0	2.8	2.8	4.0	5.9	7.4	7.5	7.6	8.3	7.1	6.1	5.1	6.4	6.5	5.6	5.4	6.5	6.5	5.7	4.8	5.3	5.2	4.5	2.8
5.7	5.6	5.6	5.6	5.6	5.5	5.0	5.6	5.7	4.4	4.6	5.1	5.6	5.8	6.0	5.9	5.5	4.9	3.9	3.0	3.2	3.4	4.1	4.3	3.8	4.4	4.3	3.9	3.8	4.7	4.8	4.8	5.0	5.3	6.6	6.1

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



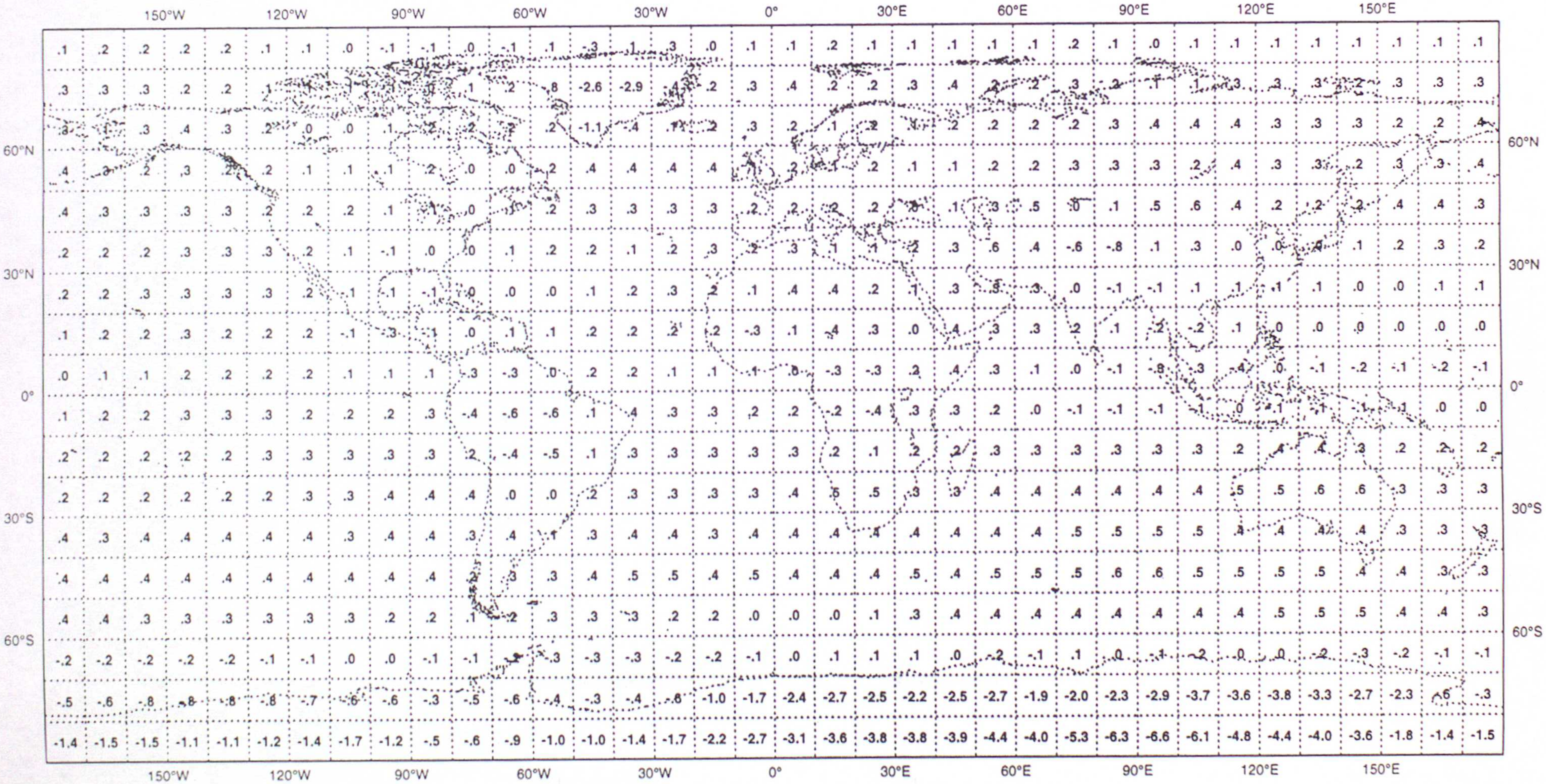
-2.9	-2.8	-2.8	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.6	-2.7	-2.6	-2.6	-2.6	-2.6	-2.7	-2.8	-2.8	-2.9	-2.9	-2.9	-2.9	-2.9	-2.9	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.9	-2.9	-2.9	-3.0	-3.0	-2.9
-2.9	-3.0	-3.1	-3.0	-3.0	-3.1	-3.1	-3.1	-3.1	-3.3	-3.4	-3.3	-3.2	-2.8	-2.6	-3.1	-3.3	-3.3	-3.3	-3.3	-3.2	-3.2	-3.2	-3.2	-3.2	-3.1	-3.0	-3.0	-2.9	-2.8	-2.8	-2.8	-2.9	-2.9	-2.9	-2.9
-2.9	-3.2	-3.5	-3.5	-3.5	-3.4	-3.3	-3.3	-3.6	-3.8	-4.0	-4.0	-4.0	-3.8	-3.9	-4.0	-3.8	-3.6	-3.4	-3.2	-3.2	-3.1	-3.1	-3.2	-3.2	-3.2	-3.1	-3.0	-3.0	-3.1	-3.1	-3.0	-3.0	-3.0	-2.9	-2.8
-4.1	-4.1	-4.4	-4.3	-4.8	-3.8	-3.8	-3.9	-4.1	-4.2	-4.2	-4.1	-4.1	-4.2	-4.2	-4.1	-3.8	-3.7	-3.4	-3.5	-3.5	-3.2	-3.4	-3.4	-3.3	-3.3	-3.3	-3.3	-3.4	-3.5	-3.7	-3.8	-3.8	-3.9	-3.8	-3.9
-4.8	-4.6	-4.3	-4.2	-4.1	-4.2	-4.0	-4.0	-4.1	-4.2	-4.1	-4.1	-4.1	-4.0	-4.0	-3.8	-3.8	-3.8	-3.6	-3.9	-3.7	-3.8	-4.0	-4.0	-4.0	-3.8	-3.8	-3.7	-3.8	-3.8	-3.9	-4.1	-4.2	-4.4	-4.6	-4.3
-4.6	-4.4	-4.1	-4.1	-4.3	-4.6	-4.5	-4.4	-4.2	-4.3	-4.4	-4.4	-4.2	-4.0	-3.8	-3.7	-3.8	-3.7	-3.6	-4.1	-4.1	-6.0	-5.2	-5.3	-5.5	-5.3	-5.0	-4.8	-4.8	-4.7	-5.0	-5.0	-4.8	-4.8	-5.0	-4.4
-4.2	-4.3	-4.4	-4.6	-4.8	-5.1	-5.1	-4.6	-4.5	-4.3	-4.4	-4.1	-4.1	-4.0	-3.9	-3.9	-3.8	-3.6	-3.9	-4.4	-4.4	-5.2	-5.4	-5.7	-6.1	-6.1	-4.9	-5.4	-5.4	-5.2	-5.4	-5.2	-4.9	-4.3	-4.7	-4.4
-4.1	-4.6	-4.6	-4.8	-4.8	-4.7	-4.7	-4.7	-4.5	-4.4	-4.3	-4.2	-4.2	-4.2	-4.2	-4.2	-4.2	-3.9	-4.2	-4.3	-4.2	-4.5	-4.8	-4.9	-5.0	-4.9	-4.9	-5.0	-4.8	-5.1	-4.9	-4.9	-4.5	-4.3	-4.6	-4.5
-4.2	-4.6	-4.5	-4.6	-4.5	-4.4	-4.5	-4.4	-4.4	-4.2	-4.2	-4.0	-4.1	-4.1	-4.0	-4.0	-4.1	-3.8	-4.0	-4.0	-4.0	-4.1	-4.3	-4.2	-4.1	-4.1	-4.2	-4.1	-4.3	-4.2	-4.3	-4.3	-4.1	-4.3	-4.4	-4.7
-4.3	-4.7	-4.6	-4.7	-4.6	-4.6	-4.8	-4.6	-4.6	-4.4	-4.1	-4.0	-4.2	-4.2	-4.2	-4.2	-4.3	-4.1	-4.3	-3.7	-4.0	-4.1	-4.3	-4.1	-4.1	-4.1	-4.1	-4.2	-4.4	-4.4	-4.4	-4.3	-4.3	-4.4	-4.5	-4.8
-4.0	-4.1	-4.1	-4.1	-4.2	-4.1	-4.3	-4.2	-4.3	-4.2	-4.0	-3.8	-3.8	-3.9	-3.8	-3.9	-3.8	-3.9	-4.1	-3.5	-4.0	-3.9	-4.0	-4.1	-4.2	-4.4	-4.3	-4.4	-4.5	-4.7	-4.7	-4.7	-4.7	-4.8	-4.8	-4.5
-3.2	-2.6	-2.8	-2.8	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.9	-3.0	-3.0	-3.0	-3.0	-3.1	-2.9	-3.1	-3.2	-2.8	-3.0	-2.9	-3.0	-3.0	-3.2	-3.4	-3.5	-3.8	-4.0	-4.2	-4.1	-4.0	-3.9	-3.9	-3.4	-3.6
-3.0	-2.0	-1.9	-1.7	-1.4	-1.3	-1.1	-1.1	-.9	-.9	-1.0	-1.3	-1.6	-1.9	-2.0	-2.2	-2.0	-2.2	-2.0	-2.1	-2.3	-2.2	-2.2	-2.3	-2.4	-2.7	-2.9	-3.3	-3.6	-3.8	-3.8	-3.7	-3.6	-3.5	-3.4	-3.2
-2.9	-1.9	-1.3	-.6	.2	.6	1.2	1.5	1.7	1.8	1.8	1.6	1.1	.7	.4	.3	.1	-.3	.0	-.5	-.8	-1.1	-1.3	-1.7	-2.2	-2.6	-3.3	-3.9	-4.4	-4.6	-4.7	-4.6	-4.6	-4.5	-4.1	-3.5
-.7	.3	1.5	2.5	3.7	4.6	5.5	6.1	6.4	6.6	6.7	6.4	6.0	5.8	5.6	5.6	5.1	5.0	5.0	4.5	3.8	3.2	2.4	1.4	.5	-.2	-1.1	-1.9	-2.5	-3.1	-3.3	-3.3	-3.2	-2.9	-2.4	-1.5
4.7	5.5	6.5	7.6	8.4	9.1	9.8	10.4	10.7	10.9	11.0	10.8	10.6	10.6	10.5	10.4	10.5	10.7	10.5	10.3	10.1	9.6	9.1	8.3	7.3	6.4	5.8	5.2	4.4	3.7	3.4	3.3	3.1	3.0	3.4	4.0
10.2	10.4	10.8	11.4	12.0	12.3	12.6	12.8	13.0	13.2	13.1	13.3	13.2	13.2	13.2	13.4	13.8	14.3	14.6	14.5	14.3	14.3	14.2	14.3	13.1	12.7	12.7	11.8	12.1	11.8	11.8	11.9	11.2	10.8	10.2	10.1
13.4	13.7	14.0	14.1	14.3	14.4	14.6	15.1	15.7	15.5	15.3	15.2	15.2	15.2	15.3	15.3	15.5	15.7	16.1	16.5	16.8	17.1	17.3	17.1	17.0	17.6	17.8	17.5	17.2	16.1	15.4	14.9	14.4	14.0	13.7	13.4

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



2.3	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.5	2.4
2.2	2.3	2.1	2.0	1.9	2.0	2.6	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.8	1.9	2.0	2.1	2.2
1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.8	1.7	1.7	1.8	1.8	1.6	1.5	1.4	1.5	1.6	1.8	2.0	2.0	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.6
1.3	1.2	1.3	1.4	1.6	1.5	1.6	1.5	1.3	1.3	1.5	1.6	1.7	1.8	1.8	1.8	1.6	1.5	1.4	1.5	1.6	1.8	2.0	1.8	1.8	1.7	1.6	1.5	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.5
1.4	1.5	1.6	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.4	1.6	1.7	1.7	2.0	1.9	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.6	1.8	1.7	1.6
1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.7	1.9	1.9	1.9	1.8	1.7	1.7	1.7	1.8	1.8	1.6	1.9	2.0	2.1	2.3	2.2	2.1	2.1	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0
2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	1.9	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0
2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.1	1.9	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8
1.5	1.5	1.5	1.5	1.5	1.6	1.8	1.7	1.7	1.6	1.6	1.7	1.6	1.6	1.5	1.7	1.6	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.9	1.3	1.5	1.5	1.4	1.3	1.3
2.0	2.1	2.2	2.3	2.4	2.6	2.6	2.5	2.5	2.3	2.1	2.1	1.9	1.9	1.9	2.1	2.0	1.8	1.8	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.3	1.4	1.4	1.3	1.3	1.4	1.4	1.5	1.5	1.7
3.3	3.7	3.9	4.0	3.9	3.6	3.4	3.1	2.8	2.8	2.8	2.5	2.5	2.5	2.5	2.5	2.7	2.8	2.7	2.9	2.7	2.6	2.6	2.5	2.4	2.3	2.1	2.0	1.9	1.8	1.8	1.9	2.1	2.5	2.8	3.0
4.1	4.2	4.2	4.1	3.6	3.1	2.8	2.5	2.4	2.4	2.4	2.4	2.5	2.6	2.5	2.5	2.7	2.7	2.6	2.6	2.7	2.7	2.8	3.0	3.0	3.0	3.3	3.4	3.4	3.4	3.5	3.6	3.7	3.7	3.8	4.0
2.9	2.9	2.8	2.6	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.0	2.0	2.2	2.3	2.2	2.2	2.7	2.7	2.7	2.5	2.7	2.7	2.8	2.9
2.4	2.6	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.3	2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.2	1.2	1.0	1.1	1.0	1.0	1.3	1.6	1.7	1.8	2.0	2.1	2.3	2.4

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.1	.2	.2	.2	.2	.1	.1	.0	-.1	-.1	.0	-.1	.1	-.3	.1	.3	.0	.1	.1	.2	.1	.1	.1	.1	.1	.2	.1	.0	.1	.1	.1	.1	.1	.1	.1	.1
.3	.3	.3	.2	.2	.1	[illegible]	[illegible]	[illegible]	[illegible]	.1	.2	.8	-2.6	-2.9	-.4	.2	.3	.4	.2	.2	.3	.4	.2	.2	.3	.2	.1	.1	.3	.3	.3	.2	.3	.3	.3
.3	.1	.3	.4	.3	.2	.0	.0	.1	.2	.2	.2	.2	-1.1	-.4	.1	.2	.3	.2	.1	.2	[illegible]	.2	.2	.2	.2	.3	.4	.4	.4	.3	.3	.3	.2	.2	.4
.4	.3	.2	.3	.2	.2	.1	.1	.1	.2	.0	.0	.2	.4	.4	.4	.4	[illegible]	.2	.1	.2	.1	.1	.2	.2	.3	.3	.3	.2	.4	.3	.3	.2	.3	.3	.4
.4	.3	.3	.3	.3	.2	.2	.2	.1	.1	.0	[illegible]	.2	.3	.3	.3	.3	.2	.2	.2	.2	[illegible]	.1	.3	.5	.0	.1	.5	.6	.4	.2	.2	.2	.4	.4	.3
.2	.2	.2	.3	.3	.3	.2	.1	-.1	.0	.0	.1	.2	.2	.1	.2	.3	.2	.3	.1	.1	.2	.3	.6	.4	-.6	-.8	.1	.3	.0	.0	.0	.1	.2	.3	.2
.2	.2	.3	.3	.3	.3	.2	-.1	-.1	-.1	.0	.0	.0	.1	.2	.3	.2	.1	.4	.4	.2	.1	.3	.3	.3	.0	-.1	-.1	.1	.1	.1	.1	.0	.0	.1	.1
.1	.2	.2	.3	.2	.2	.2	-.1	-.3	-.1	.0	.1	.1	.2	.2	.2	.2	-.3	.1	.4	.3	.0	.4	.3	.3	.2	.1	-.2	-.2	.1	.0	.0	.0	.0	.0	.0
.0	.1	.1	.2	.2	.2	.2	.1	.1	.1	-.3	-.3	.0	.2	.2	.1	.1	.1	.0	-.3	-.3	.2	.4	.3	.1	.0	-.1	-.8	-.3	-.4	.0	-.1	-.2	-.1	-.2	-.1
.1	.2	.2	.3	.3	.3	.2	.2	.2	.3	-.4	-.6	-.6	.1	.4	.3	.3	.2	.2	-.2	-.4	.3	.3	.2	.0	-.1	-.1	-.1	-.1	.0	.1	-.1	-.1	-.1	.0	.0
.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.2	-.4	-.5	.1	.3	.3	.3	.3	.3	.2	.1	.2	.2	.3	.3	.3	.3	.3	.3	.2	.4	.4	.3	.2	.2	.2
.2	.2	.2	.2	.2	.2	.3	.3	.4	.4	.4	.0	.0	.2	.3	.3	.3	.3	.4	.5	.5	.3	.3	.4	.4	.4	.4	.4	.4	.5	.5	.6	.6	.3	.3	.3
.4	.3	.4	.4	.4	.4	.4	.3	.4	.4	.3	.4	.1	.3	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.2	.3	.3	.4	.5	.5	.4	.5	.4	.4	.4	.5	.4	.5	.5	.5	.6	.6	.5	.5	.5	.5	.4	.4	.3	.3
.4	.4	.3	.3	.3	.3	.3	.3	.2	.2	.1	.2	.3	.3	.3	.2	.2	.0	.0	.0	.1	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.4	.4	.3
-.2	-.2	-.2	-.2	-.2	-.1	-.1	.0	.0	-.1	-.1	[illegible]	-.3	-.3	-.3	-.2	-.2	-.1	.0	.1	.1	.1	.0	-.2	-.1	.1	.0	-.1	-.2	.0	.0	-.2	-.3	-.2	-.1	-.1
-.5	-.6	-.8	-.8	-.8	-.8	-.7	-.6	-.6	-.3	-.5	-.6	-.4	-.3	-.4	-.8	-1.0	-1.7	-2.4	-2.7	-2.5	-2.2	-2.5	-2.7	-1.9	-2.0	-2.3	-2.9	-3.7	-3.6	-3.8	-3.3	-2.7	-2.3	-.6	-.3
-1.4	-1.5	-1.5	-1.1	-1.1	-1.2	-1.4	-1.7	-1.2	-.5	-.6	-.9	-1.0	-1.0	-1.4	-1.7	-2.2	-2.7	-3.1	-3.6	-3.8	-3.8	-3.9	-4.4	-4.0	-5.3	-6.3	-6.6	-6.1	-4.8	-4.4	-4.0	-3.6	-1.8	-1.4	-1.5

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

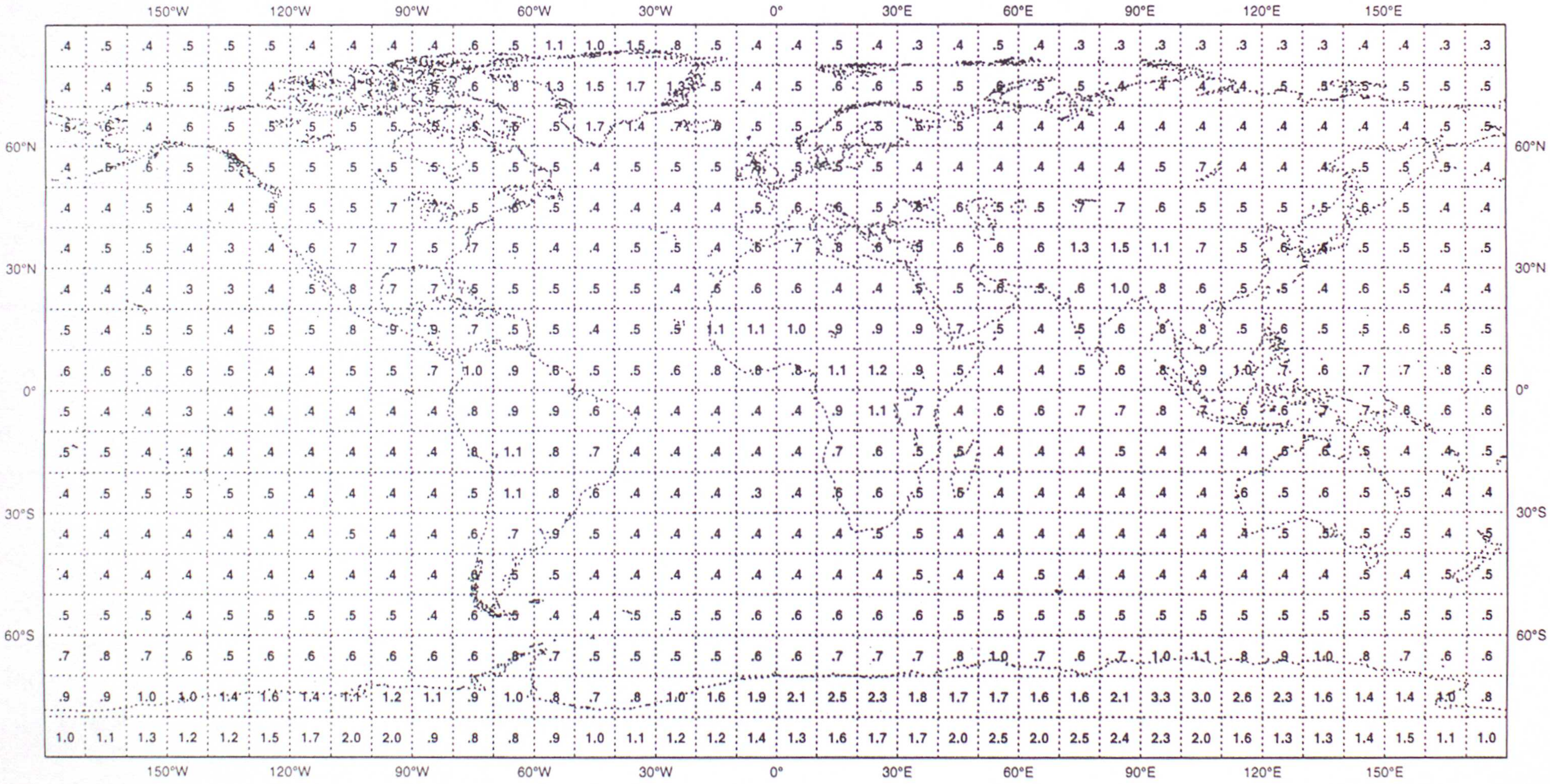

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.4 .5 .4 .5 .5 .5 .4 .4 .4 .4 .6 .5 1.1 1.0 1.5 .8 .5 .4 .4 .5 .4 .3 .4 .5 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3
.4 .4 .5 .5 .5 .4 .4 .4 .8 .5 .6 .8 1.3 1.5 1.7 1.3 .5 .4 .5 .6 .6 .5 .5 .6 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5
.5 .6 .4 .6 .5 .5 .5 .5 .5 .5 .5 .6 .5 1.7 1.4 .7 .6 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5
.4 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .7 .4 .4 .4 .5 .5 .5 .4
.4 .4 .5 .4 .4 .5 .5 .5 .7 .7 .5 .6 .5 .4 .4 .4 .4 .5 .6 .6 .5 .8 .6 .5 .5 .7 .7 .6 .5 .5 .5 .5 .6 .5 .4 .4
.4 .5 .5 .4 .3 .4 .6 .7 .7 .5 .7 .5 .4 .4 .5 .5 .4 .6 .7 .8 .6 .5 .6 .6 .6 1.3 1.5 1.1 .7 .5 .6 .5 .5 .5 .5 .5
.4 .4 .4 .3 .3 .4 .5 .8 .7 .7 .5 .5 .5 .5 .5 .4 .6 .6 .6 .4 .4 .5 .5 .6 .5 .6 1.0 .8 .6 .5 .5 .4 .6 .5 .4 .4
.5 .4 .5 .5 .4 .5 .5 .8 .9 .9 .7 .5 .5 .4 .5 .5 1.1 1.1 1.0 .9 .9 .9 .7 .5 .4 .5 .6 .8 .8 .5 .6 .5 .5 .6 .5 .5
.6 .6 .6 .6 .5 .4 .4 .5 .5 .7 1.0 .9 .8 .5 .5 .6 .8 .8 .8 1.1 1.2 .9 .5 .4 .4 .5 .6 .8 .9 1.0 .7 .6 .7 .7 .8 .6
.5 .4 .4 .3 .4 .4 .4 .4 .4 .4 .8 .9 .9 .6 .4 .4 .4 .4 .4 .9 1.1 .7 .4 .6 .6 .7 .7 .8 .7 .6 .6 .7 .7 .8 .6 .6
.5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .8 1.1 .8 .7 .4 .4 .4 .4 .4 .7 .6 .5 .5 .4 .4 .4 .5 .4 .4 .4 .6 .6 .5 .4 .4 .5
.4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 1.1 .8 .6 .4 .4 .4 .3 .4 .6 .6 .5 .5 .4 .4 .4 .4 .4 .4 .6 .5 .6 .5 .5 .4 .4
.4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .6 .7 .9 .5 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5
.5 .5 .5 .4 .5 .5 .5 .5 .5 .4 .6 .5 .4 .4 .5 .5 .5 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.7 .8 .7 .6 .5 .6 .6 .6 .6 .6 .6 .8 .7 .5 .5 .5 .5 .6 .6 .7 .7 .7 .8 1.0 .7 .6 .7 1.0 1.1 .8 .9 1.0 .8 .7 .6 .6
.9 .9 1.0 1.0 1.4 1.6 1.4 1.1 1.2 1.1 .9 1.0 .8 .7 .8 1.0 1.6 1.9 2.1 2.5 2.3 1.8 1.7 1.7 1.6 1.6 2.1 3.3 3.0 2.6 2.3 1.6 1.4 1.4 1.0 .8
1.0 1.1 1.3 1.2 1.2 1.5 1.7 2.0 2.0 .9 .8 .8 .9 1.0 1.1 1.2 1.2 1.4 1.3 1.6 1.7 1.7 2.0 2.5 2.0 2.5 2.4 2.3 2.0 1.6 1.3 1.3 1.4 1.5 1.1 1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). **SEPTEMBER 2003**
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

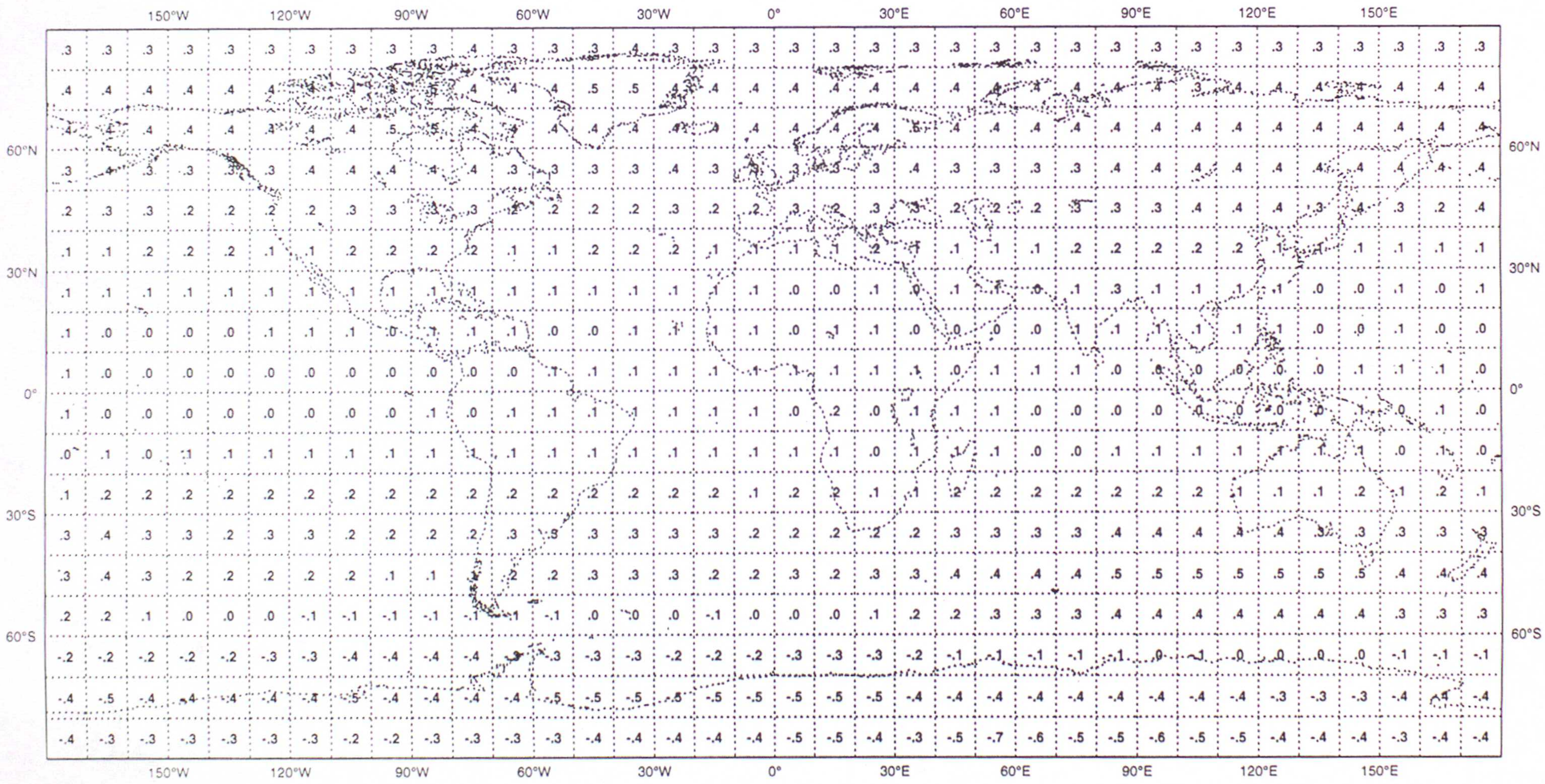

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .3 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.3 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.2 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .3 .2 .2 .3 .2 .3 .3 .2 .2 .2 .3 .3 .3 .4 .4 .4 .3 .4 .3 .2 .4
.1 .1 .2 .2 .2 .1 .1 .2 .2 .2 .2 .1 .1 .2 .2 .2 .1 .1 .1 .1 .2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1
.1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .1 .0 .1 .1 .0 .1 .3 .1 .1 .1 .1 .0 .0 .1 .0 .1
.1 .0 .0 .0 .0 .1 .1 .1 .0 .1 .1 .1 .0 .0 .1 .1 .1 .1 .0 .1 .1 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .0 .0 .1 .0 .0
.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .1 .0 .0 .0 .0 .0 .0 .1 .1 .1 .0
.1 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 .1 .1 .1 .1 .1 .1 .0 .2 .0 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 .0
.0 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .0 .1 .0
.1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .1 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .2 .1 .2 .1
.3 .4 .3 .3 .2 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3
.3 .4 .3 .2 .2 .2 .2 .2 .1 .1 .1 .2 .2 .3 .3 .3 .2 .2 .3 .2 .3 .3 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4
.2 .2 .1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 -.1 .0 .0 .0 .1 .2 .2 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3
-.2 -.2 -.2 -.2 -.2 -.3 -.3 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.2 -.2 -.2 -.3 -.3 -.3 -.2 -.1 -.1 -.1 -.1 -.1 .0 -.1 .0 .0 .0 .0 -.1 -.1 -.1
-.4 -.5 -.4 -.4 -.4 -.4 -.4 -.5 -.4 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.4 -.4 -.4
-.4 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.2 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.4 -.3 -.5 -.7 -.6 -.5 -.5 -.6 -.5 -.5 -.4 -.4 -.4 -.3 -.4 -.4

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

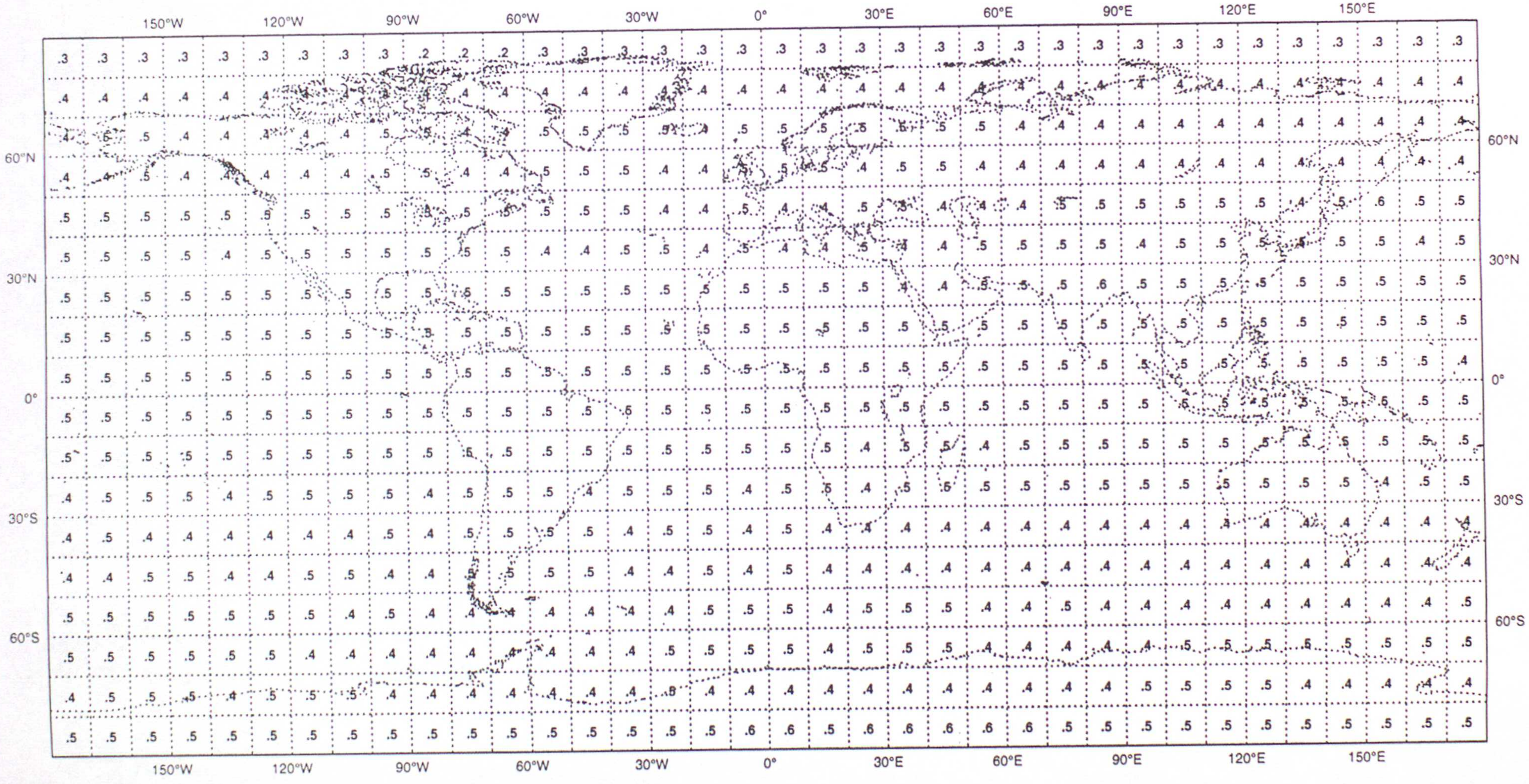

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

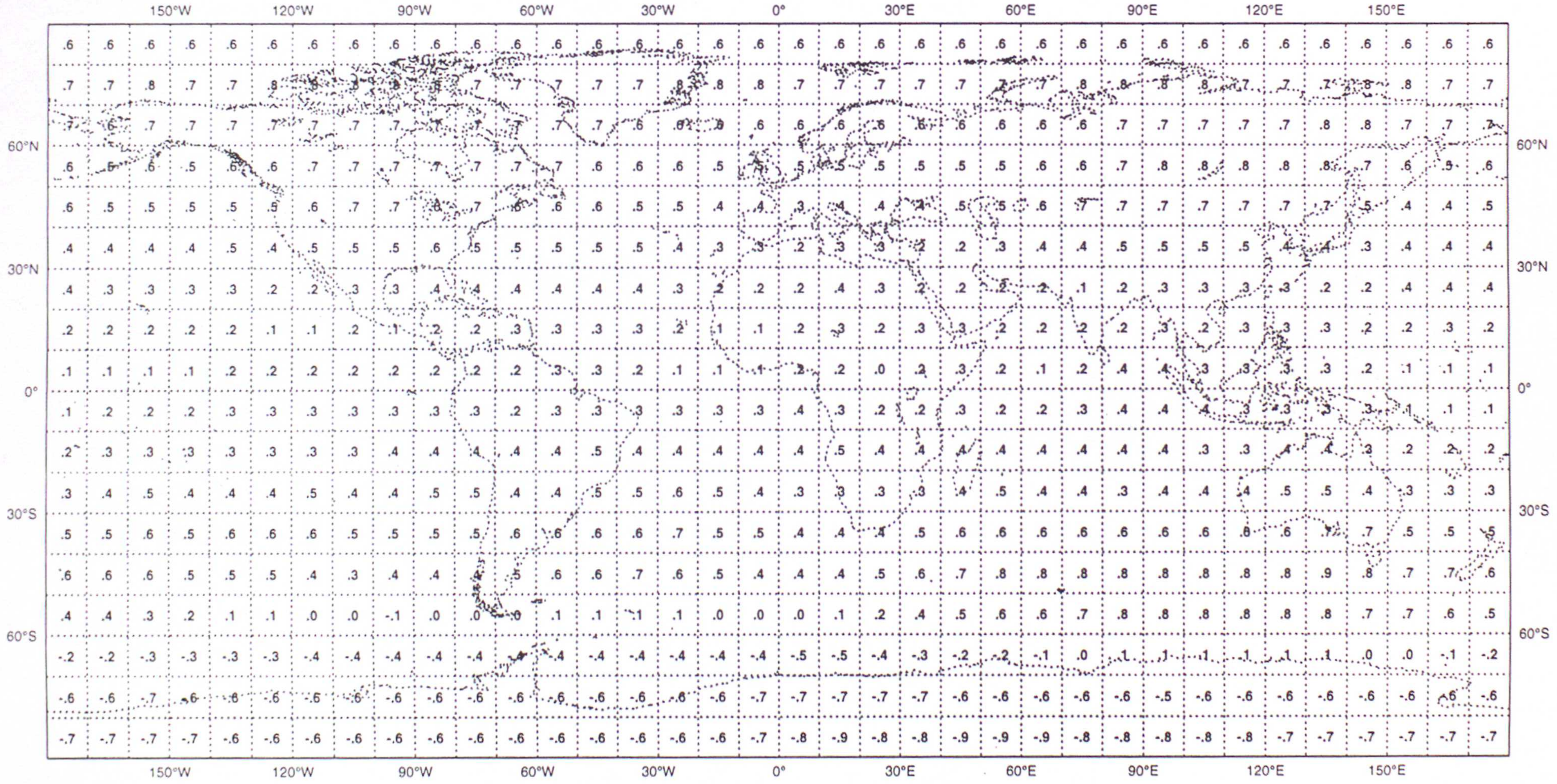

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

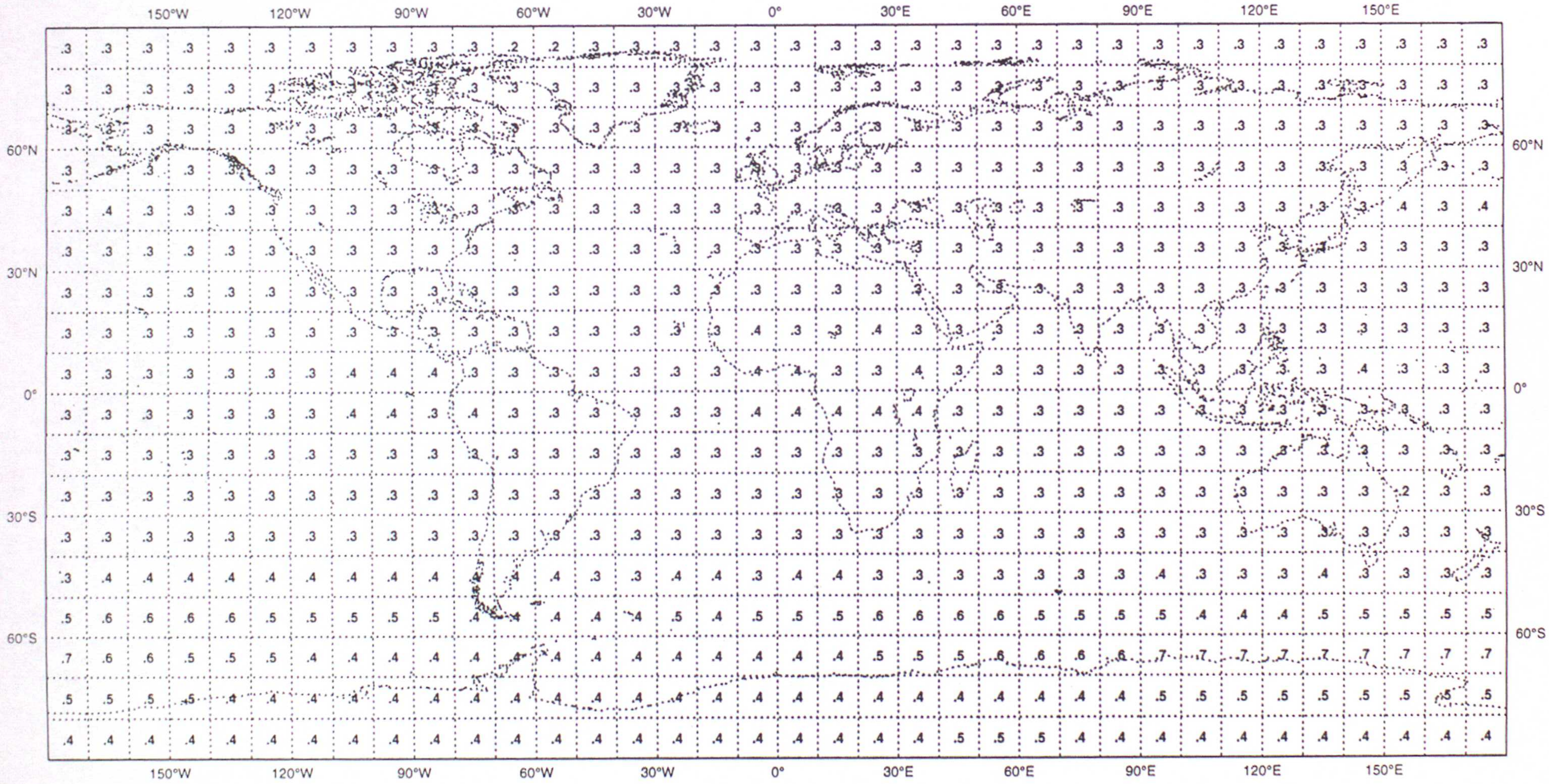
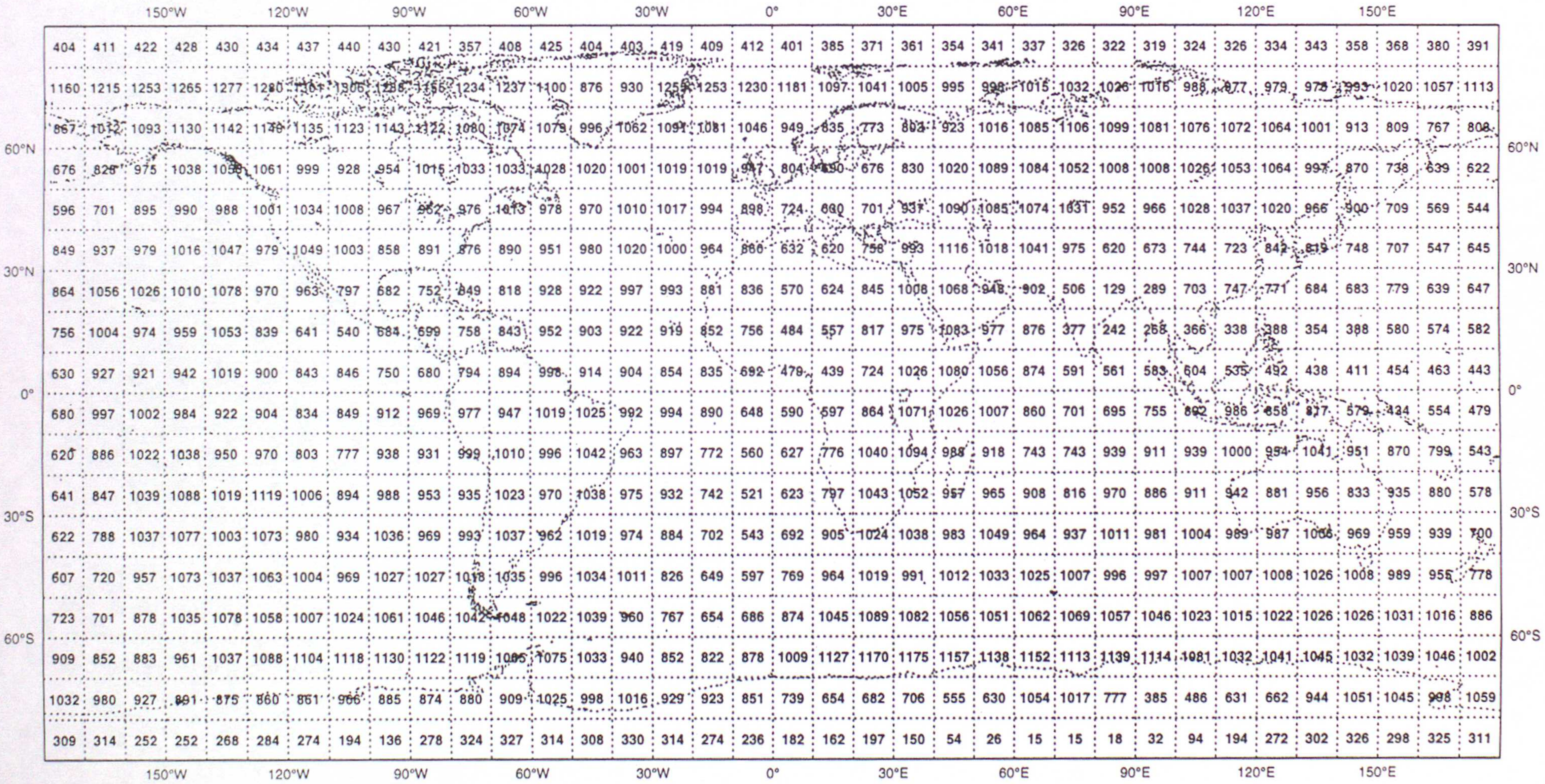

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 40. ATOVS mean daily count. SEPTEMBER 2003
NOAA16, using all observations
Global average number of observations in 24 hours = 544270



404	411	422	428	430	434	437	440	430	421	357	408	425	404	403	419	409	412	401	385	371	361	354	341	337	326	322	319	324	326	334	343	358	368	380	391
1160	1215	1253	1265	1277	1280	1301	1306	1288	1156	1234	1237	1100	876	930	1259	1253	1230	1181	1097	1041	1005	995	998	1015	1032	1026	1016	988	977	979	975	993	1020	1057	1113
867	1012	1093	1130	1142	1140	1135	1123	1143	1122	1080	1074	1079	996	1062	1091	1081	1046	949	835	773	803	923	1016	1085	1106	1099	1081	1076	1072	1064	1001	913	809	767	808
676	828	975	1038	1058	1061	999	928	954	1015	1033	1033	1028	1020	1001	1019	1019	947	804	690	676	830	1020	1089	1084	1052	1008	1008	1026	1053	1064	997	870	738	639	622
596	701	895	990	988	1001	1034	1008	967	962	976	1013	978	970	1010	1017	994	898	724	690	701	937	1090	1085	1074	1031	952	966	1028	1037	1020	966	900	709	569	544
849	937	979	1016	1047	979	1049	1003	858	891	876	890	951	980	1020	1000	964	860	632	620	756	993	1116	1018	1041	975	620	673	744	723	842	819	748	707	547	645
864	1056	1026	1010	1078	970	963	797	682	752	849	818	928	922	997	993	881	836	570	624	845	1008	1068	948	902	506	129	289	703	747	771	684	683	779	639	647
756	1004	974	959	1053	839	641	540	684	699	758	843	952	903	922	919	852	756	484	557	817	975	1083	977	876	377	242	268	366	338	388	354	388	580	574	582
630	927	921	942	1019	900	843	846	750	680	794	894	998	914	904	854	835	692	479	439	724	1026	1080	1056	874	591	561	583	604	535	492	438	411	454	463	443
680	997	1002	984	922	904	834	849	912	969	977	947	1019	1025	992	994	890	648	590	597	864	1071	1026	1007	860	701	695	755	892	986	858	877	579	434	554	479
620	886	1022	1038	950	970	803	777	938	931	999	1010	996	1042	963	897	772	560	627	776	1040	1094	988	918	743	743	939	911	939	1000	954	1041	951	870	799	543
641	847	1039	1088	1019	1119	1006	894	988	953	935	1023	970	1038	975	932	742	521	623	797	1043	1052	957	965	908	816	970	886	911	942	881	956	833	935	880	578
622	788	1037	1077	1003	1073	980	934	1036	969	993	1037	962	1019	974	884	702	543	692	905	1024	1038	983	1049	964	937	1011	981	1004	989	987	1006	969	959	939	700
607	720	957	1073	1037	1063	1004	969	1027	1027	1018	1035	996	1034	1011	826	649	597	769	964	1019	991	1012	1033	1025	1007	996	997	1007	1007	1008	1026	1008	989	955	778
723	701	878	1035	1078	1058	1007	1024	1061	1046	1042	1048	1022	1039	960	767	654	686	874	1045	1089	1082	1056	1051	1062	1069	1057	1046	1023	1015	1022	1026	1026	1031	1016	886
909	852	883	961	1037	1088	1104	1118	1130	1122	1119	1085	1075	1033	940	852	822	878	1009	1127	1170	1175	1157	1138	1152	1113	1139	1114	1081	1032	1041	1045	1032	1039	1046	1002
1032	980	927	891	875	860	861	966	885	874	880	909	1025	998	1016	929	923	851	739	654	682	706	555	630	1054	1017	777	385	486	631	662	944	1051	1045	998	1059
309	314	252	252	268	284	274	194	136	278	324	327	314	308	330	314	274	236	182	162	197	150	54	26	15	15	18	32	94	194	272	302	326	298	325	311

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations

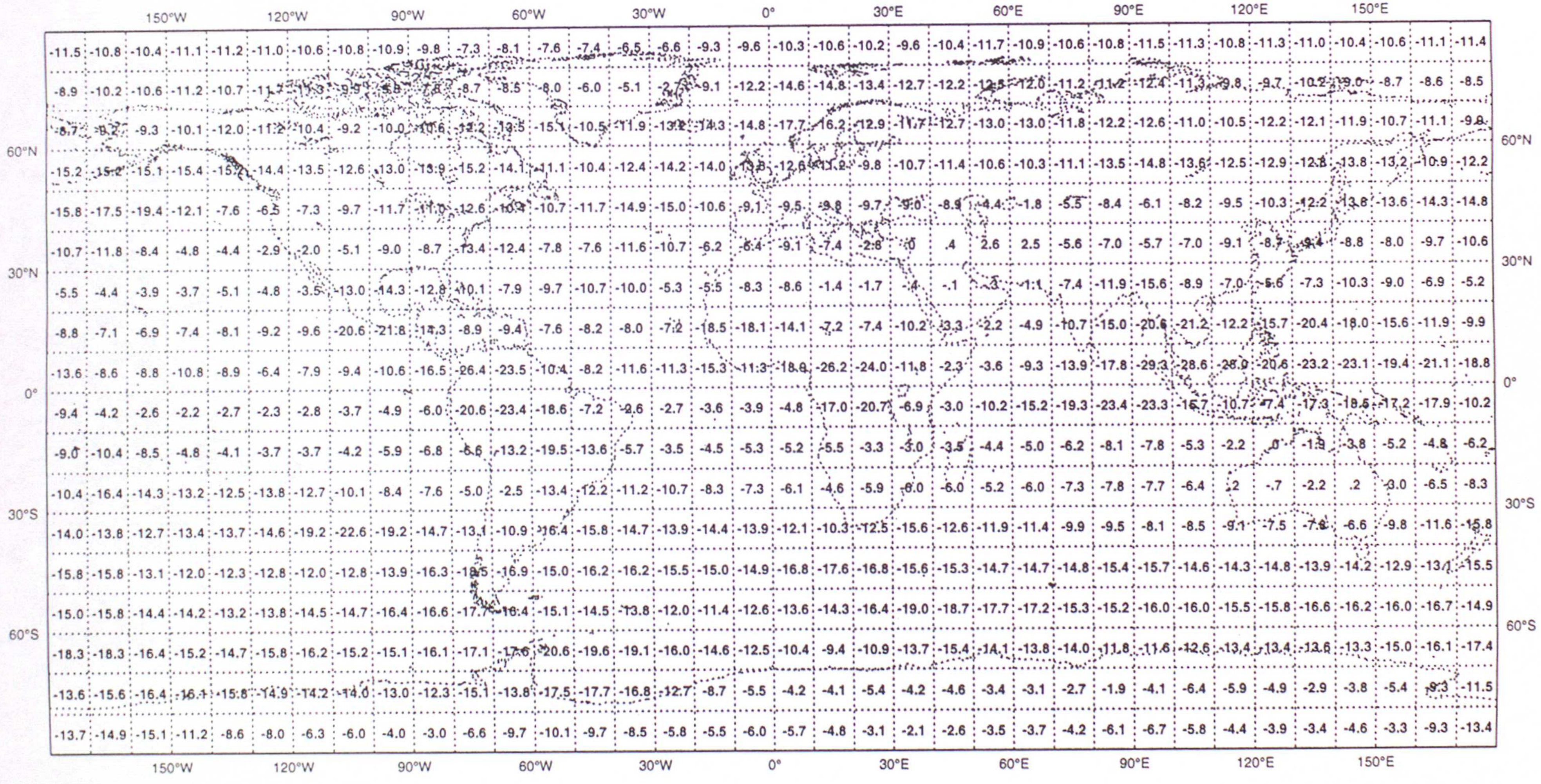
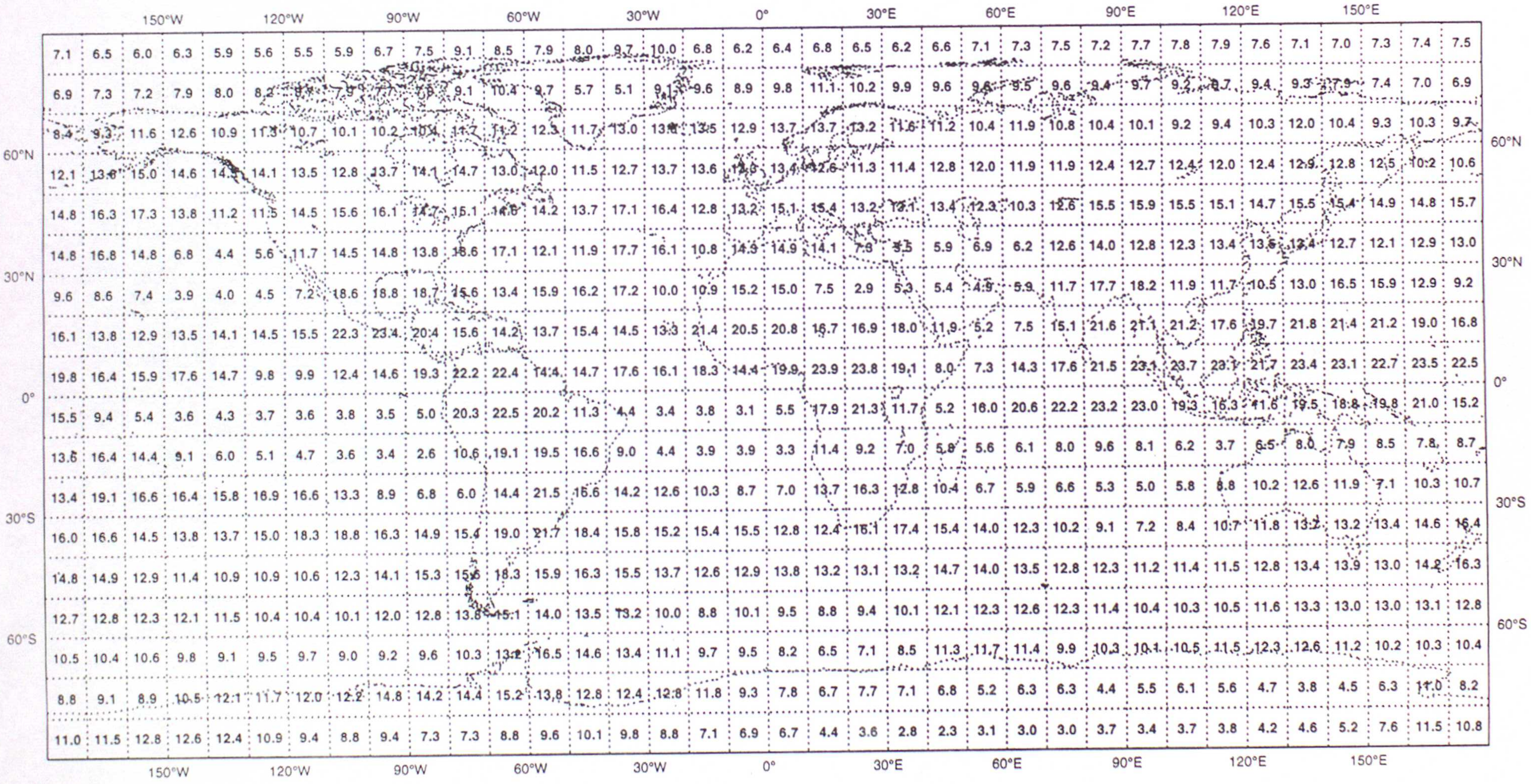

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-11.5 -10.8 -10.4 -11.1 -11.2 -11.0 -10.6 -10.8 -10.9 -9.8 -7.3 -8.1 -7.6 -7.4 -6.5 -6.6 -9.3 -9.6 -10.3 -10.6 -10.2 -9.6 -10.4 -11.7 -10.9 -10.6 -10.8 -11.5 -11.3 -10.8 -11.3 -11.0 -10.4 -10.6 -11.1 -11.4
-8.9 -10.2 -10.6 -11.2 -10.7 -11.7 -11.3 -9.9 -5.8 -7.8 -8.7 -8.5 -8.0 -6.0 -5.1 -2.7 -9.1 -12.2 -14.6 -14.8 -13.4 -12.7 -12.2 -12.5 -12.0 -11.2 -11.2 -12.4 -11.3 -9.8 -9.7 -10.2 -9.0 -8.7 -8.6 -8.5
-8.7 -9.2 -9.3 -10.1 -12.0 -11.2 -10.4 -9.2 -10.0 -10.6 -12.2 -13.5 -15.1 -10.5 -11.9 -13.2 -14.3 -14.8 -17.7 -16.2 -12.9 -11.7 -12.7 -13.0 -13.0 -11.8 -12.2 -12.6 -11.0 -10.5 -12.2 -12.1 -11.9 -10.7 -11.1 -9.8
-15.2 -15.2 -15.1 -15.4 -15.2 -14.4 -13.5 -12.6 -13.0 -13.9 -15.2 -14.1 -11.1 -10.4 -12.4 -14.2 -14.0 -13.8 -12.6 -11.2 -9.8 -10.7 -11.4 -10.6 -10.3 -11.1 -13.5 -14.8 -13.6 -12.5 -12.9 -12.8 -13.8 -13.2 -10.9 -12.2
-15.8 -17.5 -19.4 -12.1 -7.6 -6.5 -7.3 -9.7 -11.7 -11.0 -12.6 -10.4 -10.7 -11.7 -14.9 -15.0 -10.6 -9.1 -9.5 -9.8 -9.7 -9.0 -8.9 -4.4 -1.8 -5.5 -8.4 -6.1 -8.2 -9.5 -10.3 -12.2 -13.8 -13.6 -14.3 -14.8
-10.7 -11.8 -8.4 -4.8 -4.4 -2.9 -2.0 -5.1 -9.0 -8.7 -13.4 -12.4 -7.8 -7.6 -11.6 -10.7 -6.2 -6.4 -9.1 -7.4 -2.8 .0 .4 2.6 2.5 -5.6 -7.0 -5.7 -7.0 -9.1 -8.7 -9.4 -8.8 -8.0 -9.7 -10.6
-5.5 -4.4 -3.9 -3.7 -5.1 -4.8 -3.5 -13.0 -14.3 -12.8 -10.1 -7.9 -9.7 -10.7 -10.0 -5.3 -5.5 -8.3 -8.6 -1.4 -1.7 -.4 -.1 -.3 -1.1 -7.4 -11.9 -15.6 -8.9 -7.0 -5.6 -7.3 -10.3 -9.0 -6.9 -5.2
-8.8 -7.1 -6.9 -7.4 -8.1 -9.2 -9.6 -20.6 -21.8 -14.3 -8.9 -9.4 -7.6 -8.2 -8.0 -7.2 -18.5 -18.1 -14.1 -7.2 -7.4 -10.2 -3.3 -2.2 -4.9 -10.7 -15.0 -20.6 -21.2 -12.2 -15.7 -20.4 -18.0 -15.6 -11.9 -9.9
-13.6 -8.6 -8.8 -10.8 -8.9 -6.4 -7.9 -9.4 -10.6 -16.5 -26.4 -23.5 -10.4 -8.2 -11.6 -11.3 -15.3 -11.3 -18.8 -26.2 -24.0 -11.8 -2.3 -3.6 -9.3 -13.9 -17.8 -29.3 -28.6 -28.9 -20.6 -23.2 -23.1 -19.4 -21.1 -18.8
-9.4 -4.2 -2.6 -2.2 -2.7 -2.3 -2.8 -3.7 -4.9 -6.0 -20.6 -23.4 -18.6 -7.2 -2.6 -2.7 -3.6 -3.9 -4.8 -17.0 -20.7 -6.9 -3.0 -10.2 -15.2 -19.3 -23.4 -23.3 -16.7 -10.7 -7.4 -17.3 -18.5 -17.2 -17.9 -10.2
-9.0 -10.4 -8.5 -4.8 -4.1 -3.7 -3.7 -4.2 -5.9 -6.8 -6.6 -13.2 -19.5 -13.6 -5.7 -3.5 -4.5 -5.3 -5.2 -5.5 -3.3 -3.0 -3.5 -4.4 -5.0 -6.2 -8.1 -7.8 -5.3 -2.2 .0 -1.9 -3.8 -5.2 -4.8 -6.2
-10.4 -16.4 -14.3 -13.2 -12.5 -13.8 -12.7 -10.1 -8.4 -7.6 -5.0 -2.5 -13.4 -12.2 -11.2 -10.7 -8.3 -7.3 -6.1 -4.6 -5.9 -6.0 -6.0 -5.2 -6.0 -7.3 -7.8 -7.7 -6.4 .2 -.7 -2.2 .2 -3.0 -6.5 -8.3
-14.0 -13.8 -12.7 -13.4 -13.7 -14.6 -19.2 -22.6 -19.2 -14.7 -13.1 -10.9 -16.4 -15.8 -14.7 -13.9 -14.4 -13.9 -12.1 -10.3 -12.5 -15.6 -12.6 -11.9 -11.4 -9.9 -9.5 -8.1 -8.5 -9.1 -7.5 -7.8 -6.6 -9.8 -11.6 -15.8
-15.8 -15.8 -13.1 -12.0 -12.3 -12.8 -12.0 -12.8 -13.9 -16.3 -18.5 -16.9 -15.0 -16.2 -16.2 -15.5 -15.0 -14.9 -16.8 -17.6 -16.8 -15.6 -15.3 -14.7 -14.7 -14.8 -15.4 -15.7 -14.6 -14.3 -14.8 -13.9 -14.2 -12.9 -13.1 -15.5
-15.0 -15.8 -14.4 -14.2 -13.2 -13.8 -14.5 -14.7 -16.4 -16.6 -17.7 -16.4 -15.1 -14.5 -13.8 -12.0 -11.4 -12.6 -13.6 -14.3 -16.4 -19.0 -18.7 -17.7 -17.2 -15.3 -15.2 -16.0 -16.0 -15.5 -15.8 -16.6 -16.2 -16.0 -16.7 -14.9
-18.3 -18.3 -16.4 -15.2 -14.7 -15.8 -16.2 -15.2 -15.1 -16.1 -17.1 -17.6 -20.6 -19.6 -19.1 -16.0 -14.6 -12.5 -10.4 -9.4 -10.9 -13.7 -15.4 -14.1 -13.8 -14.0 -11.8 -11.6 -12.6 -13.4 -13.4 -13.6 -13.3 -15.0 -16.1 -17.4
-13.6 -15.6 -16.4 -16.1 -15.8 -14.9 -14.2 -14.0 -13.0 -12.3 -15.1 -13.8 -17.5 -17.7 -16.8 -12.7 -8.7 -5.5 -4.2 -4.1 -5.4 -4.2 -4.6 -3.4 -3.1 -2.7 -1.9 -4.1 -6.4 -5.9 -4.9 -2.9 -3.8 -5.4 -9.3 -11.5
-13.7 -14.9 -15.1 -11.2 -8.6 -8.0 -6.3 -6.0 -4.0 -3.0 -6.6 -9.7 -10.1 -9.7 -8.5 -5.8 -5.5 -6.0 -5.7 -4.8 -3.1 -2.1 -2.6 -3.5 -3.7 -4.2 -6.1 -6.7 -5.8 -4.4 -3.9 -3.4 -4.6 -3.3 -9.3 -13.4

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS8 (Surface)
NOAA16, using all observations



7.1	6.5	6.0	6.3	5.9	5.6	5.5	5.9	6.7	7.5	9.1	8.5	7.9	8.0	9.7	10.0	6.8	6.2	6.4	6.8	6.5	6.2	6.6	7.1	7.3	7.5	7.2	7.7	7.8	7.9	7.6	7.1	7.0	7.3	7.4	7.5
6.9	7.3	7.2	7.9	8.0	8.2	8.7	7.9	7.7	7.9	9.1	10.4	9.7	5.7	5.1	9.1	9.6	8.9	9.8	11.1	10.2	9.9	9.6	9.6	9.5	9.6	9.4	9.7	9.2	8.7	9.4	9.3	7.9	7.4	7.0	6.9
8.4	9.3	11.6	12.6	10.9	11.3	10.7	10.1	10.2	10.4	11.7	11.2	12.3	11.7	13.0	13.8	13.5	12.9	13.7	13.7	13.2	11.6	11.2	10.4	11.9	10.8	10.4	10.1	9.2	9.4	10.3	12.0	10.4	9.3	10.3	9.7
12.1	13.6	15.0	14.6	14.5	14.1	13.5	12.8	13.7	14.1	14.7	13.0	12.0	11.5	12.7	13.7	13.6	14.0	13.4	12.6	11.3	11.4	12.8	12.0	11.9	11.9	12.4	12.7	12.4	12.0	12.4	12.9	12.8	12.5	10.2	10.6
14.8	16.3	17.3	13.8	11.2	11.5	14.5	15.6	16.1	14.7	15.1	14.6	14.2	13.7	17.1	16.4	12.8	13.2	15.1	15.4	13.2	13.1	13.4	12.3	10.3	12.6	15.5	15.9	15.5	15.1	14.7	15.5	15.4	14.9	14.8	15.7
14.8	16.8	14.8	6.8	4.4	5.6	11.7	14.5	14.8	13.8	18.6	17.1	12.1	11.9	17.7	16.1	10.8	14.9	14.9	14.1	7.8	3.5	5.9	6.9	6.2	12.6	14.0	12.8	12.3	13.4	13.6	13.4	12.7	12.1	12.9	13.0
9.6	8.6	7.4	3.9	4.0	4.5	7.2	18.6	18.8	18.7	15.6	13.4	15.9	16.2	17.2	10.0	10.9	15.2	15.0	7.5	2.9	5.3	5.4	4.9	5.9	11.7	17.7	18.2	11.9	11.7	10.5	13.0	16.5	15.9	12.9	9.2
16.1	13.8	12.9	13.5	14.1	14.5	15.5	22.3	23.4	20.4	15.6	14.2	13.7	15.4	14.5	13.3	21.4	20.5	20.8	16.7	16.9	18.0	11.9	5.2	7.5	15.1	21.6	21.1	21.2	17.6	19.7	21.8	21.4	21.2	19.0	16.8
19.8	16.4	15.9	17.6	14.7	9.8	9.9	12.4	14.6	19.3	22.2	22.4	14.4	14.7	17.6	16.1	18.3	14.4	19.9	23.9	23.8	19.1	8.0	7.3	14.3	17.6	21.5	23.1	23.7	23.1	21.7	23.4	23.1	22.7	23.5	22.5
15.5	9.4	5.4	3.6	4.3	3.7	3.6	3.8	3.5	5.0	20.3	22.5	20.2	11.3	4.4	3.4	3.8	3.1	5.5	17.9	21.3	11.7	5.2	16.0	20.6	22.2	23.2	23.0	19.3	16.3	11.6	19.5	18.8	19.8	21.0	15.2
13.6	16.4	14.4	9.1	6.0	5.1	4.7	3.6	3.4	2.6	10.6	19.1	19.5	16.6	9.0	4.4	3.9	3.9	3.3	11.4	9.2	7.0	5.8	5.6	6.1	8.0	9.6	8.1	6.2	3.7	6.5	8.0	7.9	8.5	7.8	8.7
13.4	19.1	16.6	16.4	15.8	16.9	16.6	13.3	8.9	6.8	6.0	14.4	21.5	16.6	14.2	12.6	10.3	8.7	7.0	13.7	16.3	12.8	10.4	6.7	5.9	6.6	5.3	5.0	5.8	8.8	10.2	12.6	11.9	7.1	10.3	10.7
16.0	16.6	14.5	13.8	13.7	15.0	18.3	18.8	16.3	14.9	15.4	19.0	21.7	18.4	15.8	15.2	15.4	15.5	12.8	12.4	16.1	17.4	15.4	14.0	12.3	10.2	9.1	7.2	8.4	10.7	11.8	13.2	13.2	13.4	14.6	16.4
14.8	14.9	12.9	11.4	10.9	10.9	10.6	12.3	14.1	15.3	15.6	18.3	15.9	16.3	15.5	13.7	12.6	12.9	13.8	13.2	13.1	13.2	14.7	14.0	13.5	12.8	12.3	11.2	11.4	11.5	12.8	13.4	13.9	13.0	14.2	16.3
12.7	12.8	12.3	12.1	11.5	10.4	10.4	10.1	12.0	12.8	13.8	15.1	14.0	13.5	13.2	10.0	8.8	10.1	9.5	8.8	9.4	10.1	12.1	12.3	12.6	12.3	11.4	10.4	10.3	10.5	11.6	13.3	13.0	13.0	13.1	12.8
10.5	10.4	10.6	9.8	9.1	9.5	9.7	9.0	9.2	9.6	10.3	13.2	16.5	14.6	13.4	11.1	9.7	9.5	8.2	6.5	7.1	8.5	11.3	11.7	11.4	9.9	10.3	10.1	10.5	11.5	12.3	12.6	11.2	10.2	10.3	10.4
8.8	9.1	8.9	10.5	12.1	11.7	12.0	12.2	14.8	14.2	14.4	15.2	13.8	12.8	12.4	12.8	11.8	9.3	7.8	6.7	7.7	7.1	6.8	5.2	6.3	6.3	4.4	5.5	6.1	5.6	4.7	3.8	4.5	6.3	11.0	8.2
11.0	11.5	12.8	12.6	12.4	10.9	9.4	8.8	9.4	7.3	7.3	8.8	9.6	10.1	9.8	8.8	7.1	6.9	6.7	4.4	3.6	2.8	2.3	3.1	3.0	3.0	3.7	3.4	3.7	3.8	4.2	4.6	5.2	7.6	11.5	10.8

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

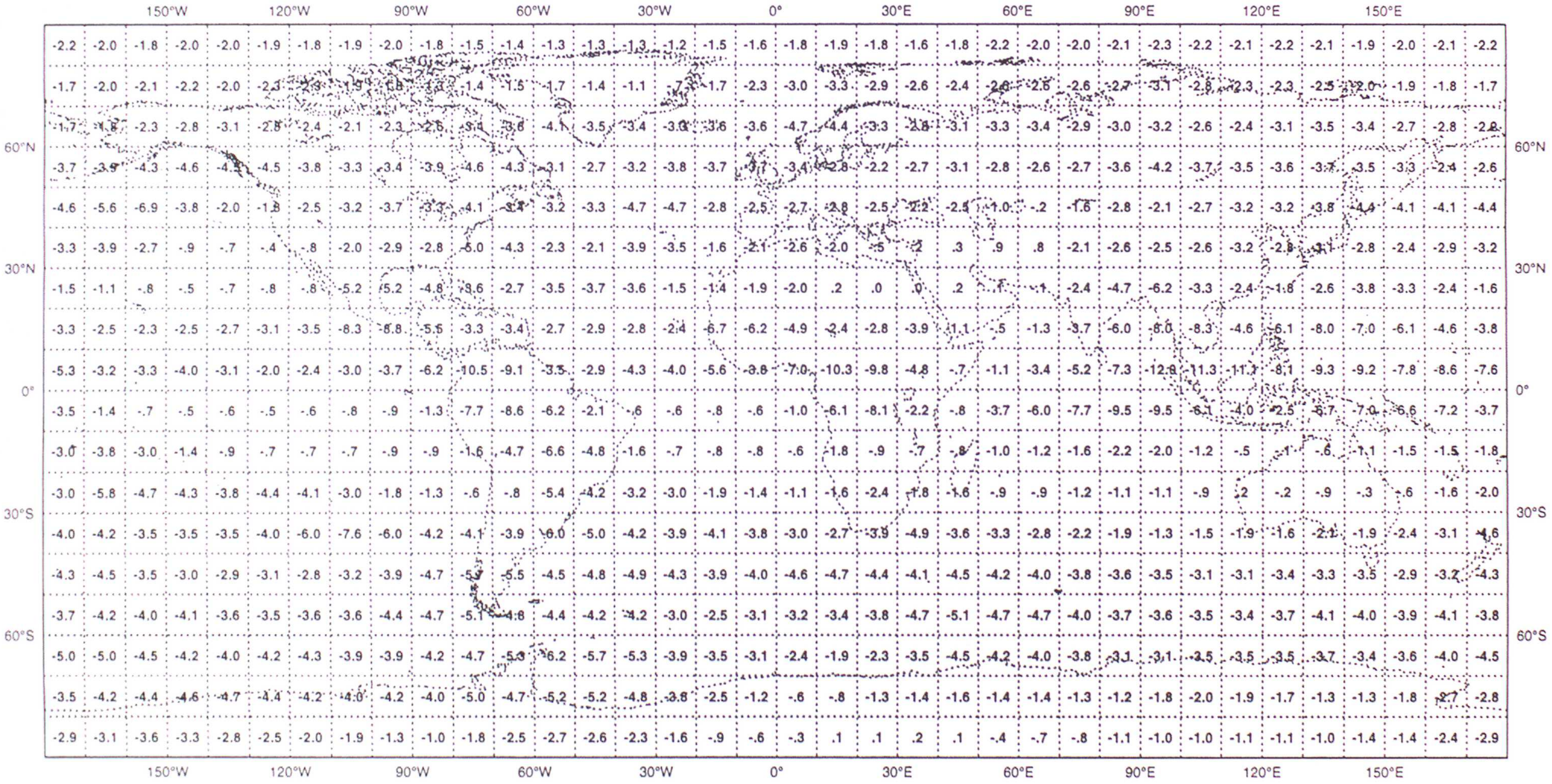
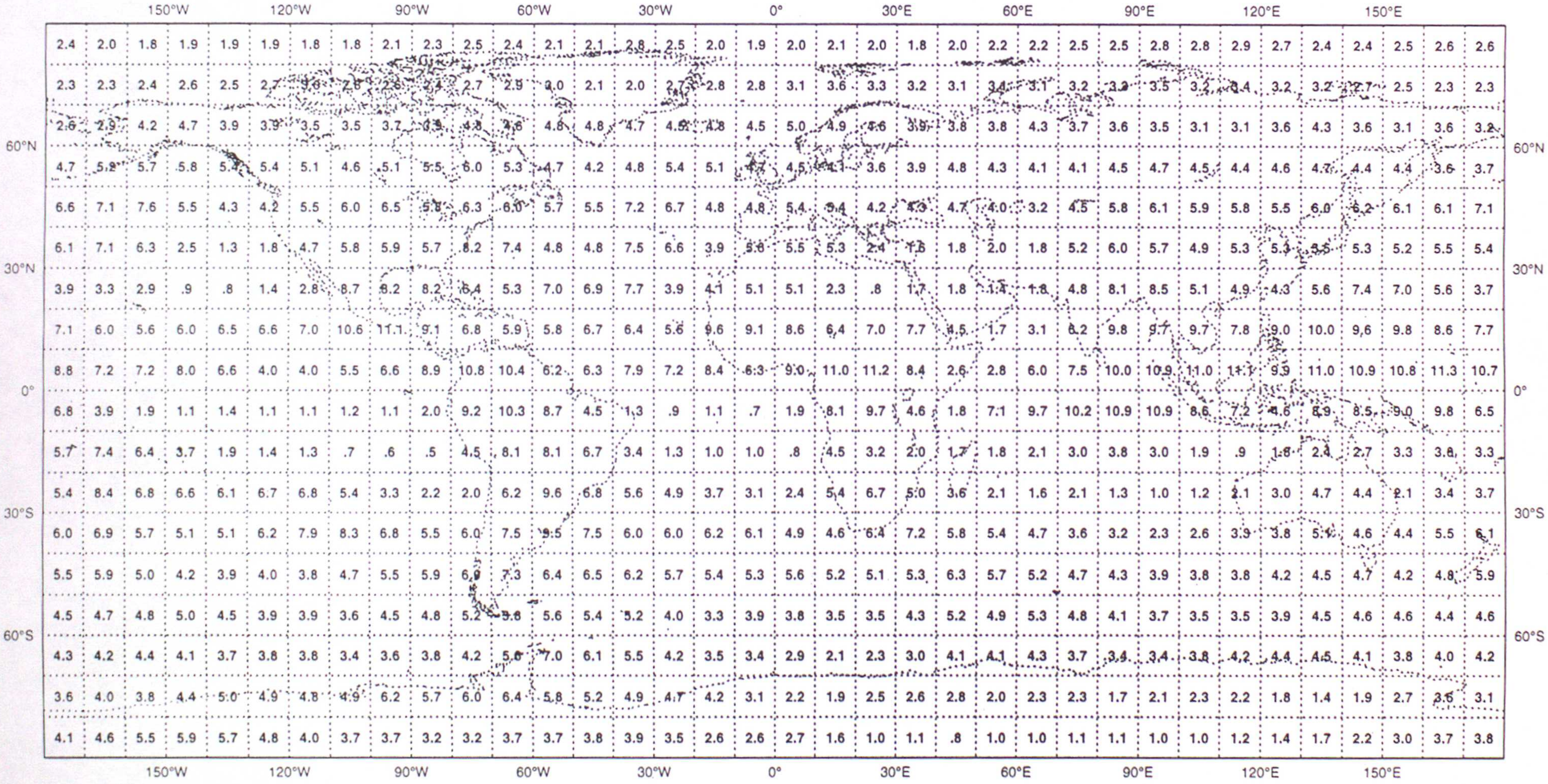
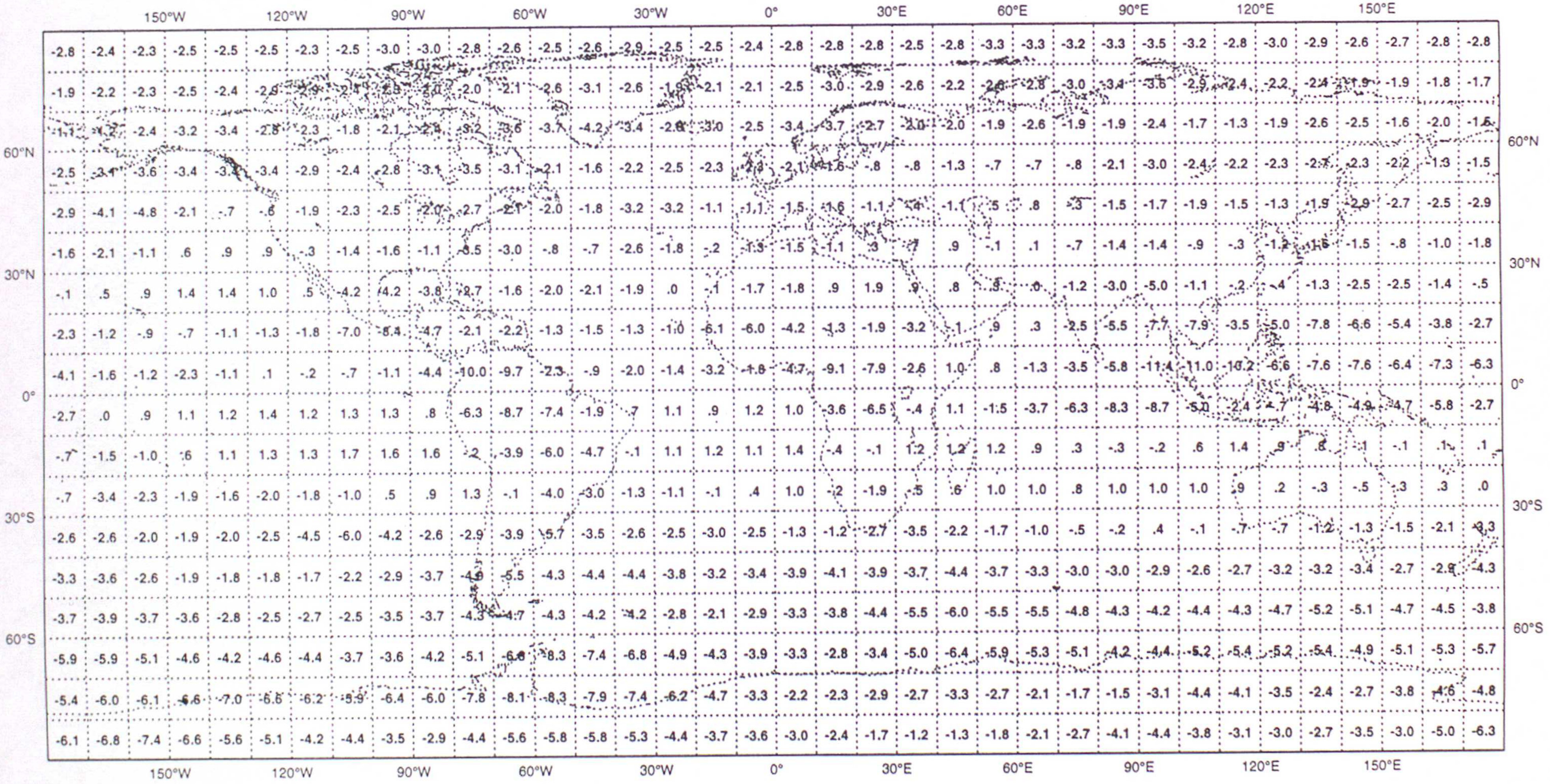

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-2.2 -2.0 -1.8 -2.0 -2.0 -1.9 -1.8 -1.9 -2.0 -1.8 -1.5 -1.4 -1.3 -1.3 -1.3 -1.2 -1.5 -1.6 -1.8 -1.9 -1.8 -1.6 -1.8 -2.2 -2.0 -2.0 -2.1 -2.3 -2.2 -2.1 -2.2 -2.1 -1.9 -2.0 -2.1 -2.2
-1.7 -2.0 -2.1 -2.2 -2.0 -2.3 -2.3 -1.9 -1.8 -1.3 -1.4 -1.5 -1.7 -1.4 -1.1 -.7 -1.7 -2.3 -3.0 -3.3 -2.9 -2.6 -2.4 -2.6 -2.6 -2.6 -2.7 -3.1 -2.8 -2.3 -2.3 -2.5 -2.0 -1.9 -1.8 -1.7
-1.7 -1.8 -2.3 -2.8 -3.1 -2.8 -2.4 -2.1 -2.3 -2.6 -3.4 -3.6 -4.1 -3.5 -3.4 -3.0 -3.6 -3.6 -4.7 -4.4 -3.3 -2.8 -3.1 -3.3 -3.4 -2.9 -3.0 -3.2 -2.6 -2.4 -3.1 -3.5 -3.4 -2.7 -2.8 -2.8
-3.7 -3.9 -4.3 -4.6 -4.3 -4.5 -3.8 -3.3 -3.4 -3.9 -4.6 -4.3 -3.1 -2.7 -3.2 -3.8 -3.7 -3.7 -3.4 -2.8 -2.2 -2.7 -3.1 -2.8 -2.6 -2.7 -3.6 -4.2 -3.7 -3.5 -3.6 -3.7 -3.5 -3.3 -2.4 -2.6
-4.6 -5.6 -6.9 -3.8 -2.0 -1.8 -2.5 -3.2 -3.7 -3.3 -4.1 -3.4 -3.2 -3.3 -4.7 -4.7 -2.8 -2.5 -2.7 -2.8 -2.5 -2.2 -2.5 -1.0 -.2 -1.6 -2.8 -2.1 -2.7 -3.2 -3.2 -3.8 -4.4 -4.1 -4.1 -4.4
-3.3 -3.9 -2.7 -.9 -.7 -.4 -.8 -2.0 -2.9 -2.8 -6.0 -4.3 -2.3 -2.1 -3.9 -3.5 -1.6 -2.1 -2.6 -2.0 -.5 -.2 .3 .9 .8 -2.1 -2.6 -2.5 -2.6 -3.2 -2.8 -3.1 -2.8 -2.4 -2.9 -3.2
-1.5 -1.1 -.8 -.5 -.7 -.8 -.8 -5.2 -5.2 -4.8 -3.6 -2.7 -3.5 -3.7 -3.6 -1.5 -1.4 -1.9 -2.0 .2 .0 .0 .2 -.1 -.1 -2.4 -4.7 -6.2 -3.3 -2.4 -1.8 -2.6 -3.8 -3.3 -2.4 -1.6
-3.3 -2.5 -2.3 -2.5 -2.7 -3.1 -3.5 -8.3 -8.8 -5.5 -3.3 -3.4 -2.7 -2.9 -2.8 -2.4 -6.7 -6.2 -4.9 -2.4 -2.8 -3.9 -1.1 -.5 -1.3 -3.7 -6.0 -8.0 -8.3 -4.6 -6.1 -8.0 -7.0 -6.1 -4.6 -3.8
-5.3 -3.2 -3.3 -4.0 -3.1 -2.0 -2.4 -3.0 -3.7 -6.2 -10.5 -9.1 -3.5 -2.9 -4.3 -4.0 -5.6 -3.8 -7.0 -10.3 -9.8 -4.8 -.7 -1.1 -3.4 -5.2 -7.3 -12.8 -11.3 -11.7 -8.1 -9.3 -9.2 -7.8 -8.6 -7.6
-3.5 -1.4 -.7 -.5 -.6 -.5 -.6 -.8 -.9 -1.3 -7.7 -8.6 -6.2 -2.1 -.6 -.6 -.8 -.6 -1.0 -6.1 -8.1 -2.2 -.8 -3.7 -6.0 -7.7 -9.5 -9.5 -6.1 -4.0 -2.5 -6.7 -7.0 -6.6 -7.2 -3.7
-3.0 -3.8 -3.0 -1.4 -.9 -.7 -.7 -.7 -.9 -.9 -1.6 -4.7 -6.6 -4.8 -1.6 -.7 -.8 -.8 -.6 -1.8 -.9 -.7 -.8 -1.0 -1.2 -1.6 -2.2 -2.0 -1.2 -.5 -.1 -.6 -1.1 -1.5 -1.5 -1.8
-3.0 -5.8 -4.7 -4.3 -3.8 -4.4 -4.1 -3.0 -1.8 -1.3 -.6 -.8 -5.4 -4.2 -3.2 -3.0 -1.9 -1.4 -1.1 -1.6 -2.4 -1.8 -1.6 -.9 -.9 -1.2 -1.1 -1.1 -.9 .2 -.2 -.9 -.3 -.6 -1.6 -2.0
-4.0 -4.2 -3.5 -3.5 -3.5 -4.0 -6.0 -7.6 -6.0 -4.2 -4.1 -3.9 -6.0 -5.0 -4.2 -3.9 -4.1 -3.8 -3.0 -2.7 -3.9 -4.9 -3.6 -3.3 -2.8 -2.2 -1.9 -1.3 -1.5 -1.9 -1.6 -2.1 -1.9 -2.4 -3.1 -4.6
-4.3 -4.5 -3.5 -3.0 -2.9 -3.1 -2.8 -3.2 -3.9 -4.7 -5.7 -5.5 -4.5 -4.8 -4.9 -4.3 -3.9 -4.0 -4.6 -4.7 -4.4 -4.1 -4.5 -4.2 -4.0 -3.8 -3.6 -3.5 -3.1 -3.1 -3.4 -3.3 -3.5 -2.9 -3.2 -4.3
-3.7 -4.2 -4.0 -4.1 -3.6 -3.5 -3.6 -3.6 -4.4 -4.7 -5.1 -4.8 -4.4 -4.2 -4.2 -3.0 -2.5 -3.1 -3.2 -3.4 -3.8 -4.7 -5.1 -4.7 -4.7 -4.0 -3.7 -3.6 -3.5 -3.4 -3.7 -4.1 -4.0 -3.9 -4.1 -3.8
-5.0 -5.0 -4.5 -4.2 -4.0 -4.2 -4.3 -3.9 -3.9 -4.2 -4.7 -5.3 -6.2 -5.7 -5.3 -3.9 -3.5 -3.1 -2.4 -1.9 -2.3 -3.5 -4.5 -4.2 -4.0 -3.8 -3.1 -3.1 -3.5 -3.5 -3.5 -3.7 -3.4 -3.6 -4.0 -4.5
-3.5 -4.2 -4.4 -4.6 -4.7 -4.4 -4.2 -4.0 -4.2 -4.0 -5.0 -4.7 -5.2 -5.2 -4.8 -3.8 -2.5 -1.2 -.6 -.8 -1.3 -1.4 -1.6 -1.4 -1.4 -1.3 -1.2 -1.8 -2.0 -1.9 -1.7 -1.3 -1.3 -1.8 -2.7 -2.8
-2.9 -3.1 -3.6 -3.3 -2.8 -2.5 -2.0 -1.9 -1.3 -1.0 -1.8 -2.5 -2.7 -2.6 -2.3 -1.6 -.9 -.6 -.3 .1 .1 .2 .1 -.4 -.7 -.8 -1.1 -1.0 -1.0 -1.1 -1.1 -1.0 -1.4 -1.4 -2.4 -2.9
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



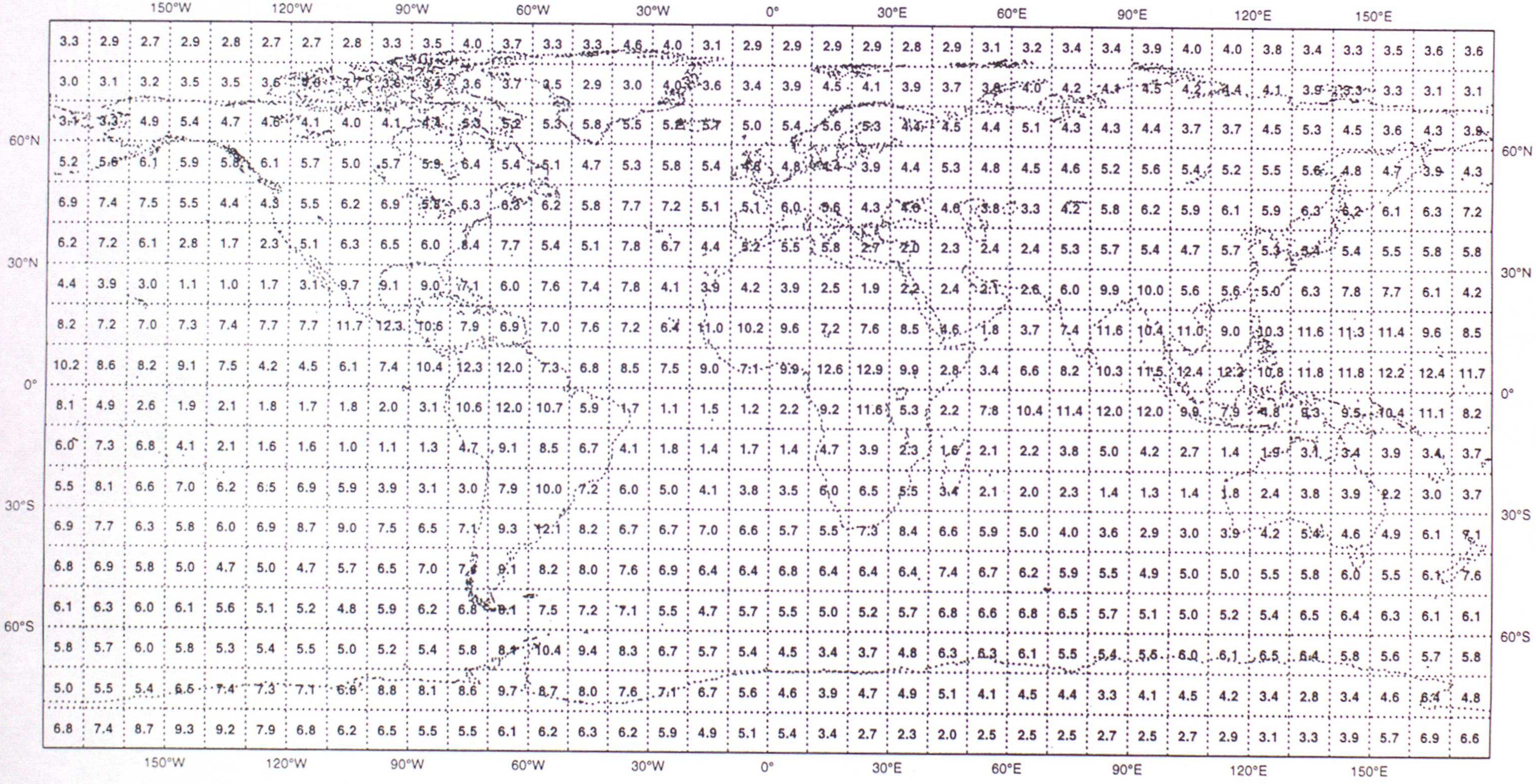
2.4	2.0	1.8	1.9	1.9	1.9	1.8	1.8	2.1	2.3	2.5	2.4	2.1	2.1	2.8	2.5	2.0	1.9	2.0	2.1	2.0	1.8	2.0	2.2	2.2	2.5	2.5	2.8	2.8	2.9	2.7	2.4	2.4	2.5	2.6	2.6
2.3	2.3	2.4	2.6	2.5	2.7	3.6	2.8	2.6	2.4	2.7	2.9	3.0	2.1	2.0	2.7	2.8	2.8	3.1	3.6	3.3	3.2	3.1	3.4	3.1	3.2	3.3	3.5	3.2	3.4	3.2	3.2	2.7	2.5	2.3	2.3
2.6	2.9	4.2	4.7	3.9	3.9	3.5	3.5	3.7	3.9	4.8	4.6	4.8	4.8	4.7	4.5	4.8	4.5	5.0	4.9	4.6	3.9	3.8	3.8	4.3	3.7	3.6	3.5	3.1	3.1	3.6	4.3	3.6	3.1	3.6	3.2
4.7	5.2	5.7	5.8	5.4	5.4	5.1	4.6	5.1	5.5	6.0	5.3	4.7	4.2	4.8	5.4	5.1	4.7	4.5	4.1	3.6	3.9	4.8	4.3	4.1	4.1	4.5	4.7	4.5	4.4	4.6	4.7	4.4	4.4	3.6	3.7
6.6	7.1	7.6	5.5	4.3	4.2	5.5	6.0	6.5	5.8	6.3	6.0	5.7	5.5	7.2	6.7	4.8	4.8	5.4	5.4	4.2	4.3	4.7	4.0	3.2	4.5	5.8	6.1	5.9	5.8	5.5	6.0	6.2	6.1	6.1	7.1
6.1	7.1	6.3	2.5	1.3	1.8	4.7	5.8	5.9	5.7	8.2	7.4	4.8	4.8	7.5	6.6	3.9	5.6	5.5	5.3	2.4	1.5	1.8	2.0	1.8	5.2	6.0	5.7	4.9	5.3	5.3	5.5	5.3	5.2	5.5	5.4
3.9	3.3	2.9	.9	.8	1.4	2.8	8.7	8.2	8.2	6.4	5.3	7.0	6.9	7.7	3.9	4.1	5.1	5.1	2.3	.8	1.7	1.8	1.4	1.8	4.8	8.1	8.5	5.1	4.9	4.3	5.6	7.4	7.0	5.6	3.7
7.1	6.0	5.6	6.0	6.5	6.6	7.0	10.6	11.1	9.1	6.8	5.9	5.8	6.7	6.4	5.6	9.6	9.1	8.6	6.4	7.0	7.7	4.5	1.7	3.1	6.2	9.8	9.7	9.7	7.8	9.0	10.0	9.6	9.8	8.6	7.7
8.8	7.2	7.2	8.0	6.6	4.0	4.0	5.5	6.6	8.9	10.8	10.4	6.2	6.3	7.9	7.2	8.4	6.3	9.0	11.0	11.2	8.4	2.6	2.8	6.0	7.5	10.0	10.9	11.0	11.1	9.9	11.0	10.9	10.8	11.3	10.7
6.8	3.9	1.9	1.1	1.4	1.1	1.1	1.2	1.1	2.0	9.2	10.3	8.7	4.5	1.3	.9	1.1	.7	1.9	8.1	9.7	4.6	1.8	7.1	9.7	10.2	10.9	10.9	8.6	7.2	4.6	8.9	8.5	9.0	9.8	6.5
5.7	7.4	6.4	3.7	1.9	1.4	1.3	.7	.6	.5	4.5	8.1	8.1	6.7	3.4	1.3	1.0	1.0	.8	4.5	3.2	2.0	1.7	1.8	2.1	3.0	3.8	3.0	1.9	.9	1.8	2.4	2.7	3.3	3.8	3.3
5.4	8.4	6.8	6.6	6.1	6.7	6.8	5.4	3.3	2.2	2.0	6.2	9.6	6.8	5.6	4.9	3.7	3.1	2.4	5.4	6.7	5.0	3.6	2.1	1.6	2.1	1.3	1.0	1.2	2.1	3.0	4.7	4.4	2.1	3.4	3.7
6.0	6.9	5.7	5.1	5.1	6.2	7.9	8.3	6.8	5.5	6.0	7.5	9.5	7.5	6.0	6.0	6.2	6.1	4.9	4.6	6.4	7.2	5.8	5.4	4.7	3.6	3.2	2.3	2.6	3.9	3.8	5.1	4.6	4.4	5.5	6.1
5.5	5.9	5.0	4.2	3.9	4.0	3.8	4.7	5.5	5.9	6.9	7.3	6.4	6.5	6.2	5.7	5.4	5.3	5.6	5.2	5.1	5.3	6.3	5.7	5.2	4.7	4.3	3.9	3.8	3.8	4.2	4.5	4.7	4.2	4.8	5.9
4.5	4.7	4.8	5.0	4.5	3.9	3.9	3.6	4.5	4.8	5.2	5.8	5.6	5.4	5.2	4.0	3.3	3.9	3.8	3.5	3.5	4.3	5.2	4.9	5.3	4.8	4.1	3.7	3.5	3.5	3.9	4.5	4.6	4.6	4.4	4.6
4.3	4.2	4.4	4.1	3.7	3.8	3.8	3.4	3.6	3.8	4.2	5.6	7.0	6.1	5.5	4.2	3.5	3.4	2.9	2.1	2.3	3.0	4.1	4.1	4.3	3.7	3.4	3.4	3.8	4.2	4.4	4.5	4.1	3.8	4.0	4.2
3.6	4.0	3.8	4.4	5.0	4.9	4.8	4.9	6.2	5.7	6.0	6.4	5.8	5.2	4.9	4.7	4.2	3.1	2.2	1.9	2.5	2.6	2.8	2.0	2.3	2.3	1.7	2.1	2.3	2.2	1.8	1.4	1.9	2.7	3.6	3.1
4.1	4.6	5.5	5.9	5.7	4.8	4.0	3.7	3.7	3.2	3.2	3.7	3.7	3.8	3.9	3.5	2.6	2.6	2.7	1.6	1.0	1.1	.8	1.0	1.0	1.1	1.1	1.0	1.0	1.2	1.4	1.7	2.2	3.0	3.7	3.8

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



-2.8	-2.4	-2.3	-2.5	-2.5	-2.5	-2.3	-2.5	-3.0	-3.0	-2.8	-2.6	-2.5	-2.6	-2.9	-2.5	-2.5	-2.4	-2.8	-2.8	-2.8	-2.5	-2.8	-3.3	-3.3	-3.2	-3.3	-3.5	-3.2	-2.8	-3.0	-2.9	-2.6	-2.7	-2.8	-2.8
-1.9	-2.2	-2.3	-2.5	-2.4	-2.9	-2.9	-2.4	-2.3	-2.0	-2.0	-2.1	-2.6	-3.1	-2.6	-1.9	-2.1	-2.1	-2.5	-3.0	-2.9	-2.6	-2.2	-2.6	-2.8	-3.0	-3.4	-3.6	-2.9	-2.4	-2.2	-2.4	-1.9	-1.9	-1.8	-1.7
-1.1	-1.2	-2.4	-3.2	-3.4	-2.8	-2.3	-1.8	-2.1	-2.4	-3.2	-3.6	-3.7	-4.2	-3.4	-2.8	-3.0	-2.5	-3.4	-3.7	-2.7	-2.0	-2.0	-1.9	-2.6	-1.9	-1.9	-2.4	-1.7	-1.3	-1.9	-2.6	-2.5	-1.6	-2.0	-1.6
-2.5	-3.4	-3.6	-3.4	-3.2	-3.4	-2.9	-2.4	-2.8	-3.1	-3.5	-3.1	-2.1	-1.6	-2.2	-2.5	-2.3	-2.3	-2.1	-1.6	-.8	-.8	-1.3	-.7	-.7	-.8	-2.1	-3.0	-2.4	-2.2	-2.3	-2.7	-2.3	-2.2	-1.3	-1.5
-2.9	-4.1	-4.8	-2.1	-.7	-.6	-1.9	-2.3	-2.5	-2.0	-2.7	-2.1	-2.0	-1.8	-3.2	-3.2	-1.1	-1.1	-1.5	-1.6	-1.1	-.4	-1.1	.5	.8	.3	-1.5	-1.7	-1.9	-1.5	-1.3	-1.9	-2.9	-2.7	-2.5	-2.9
-1.6	-2.1	-1.1	.6	.9	.9	-.3	-1.4	-1.6	-1.1	-3.5	-3.0	-.8	-.7	-2.6	-1.8	-.2	-1.3	-1.5	-1.1	.3	.7	.9	-.1	.1	-.7	-1.4	-1.4	-.9	-.3	-1.2	-1.6	-1.5	-.8	-1.0	-1.8
-.1	.5	.9	1.4	1.4	1.0	.5	-4.2	-4.2	-3.8	-2.7	-1.6	-2.0	-2.1	-1.9	.0	-.1	-1.7	-1.8	.9	1.9	.9	.8	.3	.0	-1.2	-3.0	-5.0	-1.1	-.2	-.4	-1.3	-2.5	-2.5	-1.4	-.5
-2.3	-1.2	-.9	-.7	-1.1	-1.3	-1.8	-7.0	-8.4	-4.7	-2.1	-2.2	-1.3	-1.5	-1.3	-1.0	-6.1	-6.0	-4.2	-1.3	-1.9	-3.2	-.1	.9	.3	-2.5	-5.5	-7.7	-7.9	-3.5	-5.0	-7.8	-6.6	-5.4	-3.8	-2.7
-4.1	-1.6	-1.2	-2.3	-1.1	.1	-.2	-.7	-1.1	-4.4	-10.0	-9.7	-2.3	-.9	-2.0	-1.4	-3.2	-1.8	-4.7	-9.1	-7.9	-2.6	1.0	.8	-1.3	-3.5	-5.8	-11.4	-11.0	-10.2	-6.6	-7.6	-7.6	-6.4	-7.3	-6.3
-2.7	.0	.9	1.1	1.2	1.4	1.2	1.3	1.3	.8	-6.3	-8.7	-7.4	-1.9	.7	1.1	.9	1.2	1.0	-3.6	-6.5	-.4	1.1	-1.5	-3.7	-6.3	-8.3	-8.7	-5.0	-2.4	-.7	-4.8	-4.9	-4.7	-5.8	-2.7
-.7	-1.5	-1.0	.6	1.1	1.3	1.3	1.7	1.6	1.6	-.2	-3.9	-6.0	-4.7	-.1	1.1	1.2	1.1	1.4	-.4	-.1	1.2	1.2	1.2	.9	.3	-.3	-.2	.6	1.4	.9	.8	-.1	-.1	.1	.1
-.7	-3.4	-2.3	-1.9	-1.6	-2.0	-1.8	-1.0	.5	.9	1.3	-.1	-4.0	-3.0	-1.3	-1.1	-.1	.4	1.0	-.2	-1.9	-.5	.6	1.0	1.0	.8	1.0	1.0	1.0	.9	.2	-.3	-.5	-.3	.3	.0
-2.6	-2.6	-2.0	-1.9	-2.0	-2.5	-4.5	-6.0	-4.2	-2.6	-2.9	-3.9	-5.7	-3.5	-2.6	-2.5	-3.0	-2.5	-1.3	-1.2	-2.7	-3.5	-2.2	-1.7	-1.0	-.5	-.2	.4	-.1	-.7	-.7	-1.2	-1.3	-1.5	-2.1	-3.3
-3.3	-3.6	-2.6	-1.9	-1.8	-1.8	-1.7	-2.2	-2.9	-3.7	-4.9	-5.5	-4.3	-4.4	-4.4	-3.8	-3.2	-3.4	-3.9	-4.1	-3.9	-3.7	-4.4	-3.7	-3.3	-3.0	-3.0	-2.9	-2.6	-2.7	-3.2	-3.2	-3.4	-2.7	-2.9	-4.3
-3.7	-3.9	-3.7	-3.6	-2.8	-2.5	-2.7	-2.5	-3.5	-3.7	-4.3	-4.7	-4.3	-4.2	-4.2	-2.8	-2.1	-2.9	-3.3	-3.8	-4.4	-5.5	-6.0	-5.5	-5.5	-4.8	-4.3	-4.2	-4.4	-4.3	-4.7	-5.2	-5.1	-4.7	-4.5	-3.8
-5.9	-5.9	-5.1	-4.6	-4.2	-4.6	-4.4	-3.7	-3.6	-4.2	-5.1	-6.8	-8.3	-7.4	-6.8	-4.9	-4.3	-3.9	-3.3	-2.8	-3.4	-5.0	-6.4	-5.9	-5.3	-5.1	-4.2	-4.4	-5.2	-5.4	-5.2	-5.4	-4.9	-5.1	-5.3	-5.7
-5.4	-6.0	-6.1	-6.6	-7.0	-6.6	-6.2	-5.9	-6.4	-6.0	-7.8	-8.1	-8.3	-7.9	-7.4	-6.2	-4.7	-3.3	-2.2	-2.3	-2.9	-2.7	-3.3	-2.7	-2.1	-1.7	-1.5	-3.1	-4.4	-4.1	-3.5	-2.4	-2.7	-3.8	-4.6	-4.8
-6.1	-6.8	-7.4	-6.6	-5.6	-5.1	-4.2	-4.4	-3.5	-2.9	-4.4	-5.6	-5.8	-5.8	-5.3	-4.4	-3.7	-3.6	-3.0	-2.4	-1.7	-1.2	-1.3	-1.8	-2.1	-2.7	-4.1	-4.4	-3.8	-3.1	-3.0	-2.7	-3.5	-3.0	-5.0	-6.3

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



3.3	2.9	2.7	2.9	2.8	2.7	2.7	2.8	3.3	3.5	4.0	3.7	3.3	3.3	4.6	4.0	3.1	2.9	2.9	2.9	2.9	2.8	2.9	3.1	3.2	3.4	3.4	3.9	4.0	4.0	3.8	3.4	3.3	3.5	3.6	3.6
3.0	3.1	3.2	3.5	3.5	3.6	3.6	3.7	3.6	3.4	3.6	3.7	3.5	2.9	3.0	4.0	3.6	3.4	3.9	4.5	4.1	3.9	3.7	3.8	4.0	4.2	4.1	4.5	4.2	4.4	4.1	3.9	3.3	3.3	3.1	3.1
3.1	3.3	4.9	5.4	4.7	4.6	4.1	4.0	4.1	4.4	5.3	5.2	5.3	5.8	5.5	5.2	5.7	5.0	5.4	5.6	5.3	4.4	4.5	4.4	5.1	4.3	4.3	4.4	3.7	3.7	4.5	5.3	4.5	3.6	4.3	3.9
5.2	5.6	6.1	5.9	5.8	6.1	5.7	5.0	5.7	5.9	6.4	5.4	5.1	4.7	5.3	5.8	5.4	4.6	4.8	4.4	3.9	4.4	5.3	4.8	4.5	4.6	5.2	5.6	5.4	5.2	5.5	5.6	4.8	4.7	3.9	4.3
6.9	7.4	7.5	5.5	4.4	4.3	5.5	6.2	6.9	5.8	6.3	6.3	6.2	5.8	7.7	7.2	5.1	5.1	6.0	5.6	4.3	4.6	4.6	3.8	3.3	4.2	5.8	6.2	5.9	6.1	5.9	6.3	6.2	6.1	6.3	7.2
6.2	7.2	6.1	2.8	1.7	2.3	5.1	6.3	6.5	6.0	8.4	7.7	5.4	5.1	7.8	6.7	4.4	5.2	5.5	5.8	2.7	2.0	2.3	2.4	2.4	5.3	5.7	5.4	4.7	5.7	5.3	5.4	5.4	5.5	5.8	5.8
4.4	3.9	3.0	1.1	1.0	1.7	3.1	9.7	9.1	9.0	7.1	6.0	7.6	7.4	7.8	4.1	3.9	4.2	3.9	2.5	1.9	2.2	2.4	2.1	2.6	6.0	9.9	10.0	5.6	5.6	5.0	6.3	7.8	7.7	6.1	4.2
8.2	7.2	7.0	7.3	7.4	7.7	7.7	11.7	12.3	10.6	7.9	6.9	7.0	7.6	7.2	6.4	11.0	10.2	9.6	7.2	7.6	8.5	4.6	1.8	3.7	7.4	11.6	10.4	11.0	9.0	10.3	11.6	11.3	11.4	9.6	8.5
10.2	8.6	8.2	9.1	7.5	4.2	4.5	6.1	7.4	10.4	12.3	12.0	7.3	6.8	8.5	7.5	9.0	7.1	9.9	12.6	12.9	9.9	2.8	3.4	6.6	8.2	10.3	11.5	12.4	12.2	10.8	11.8	11.8	12.2	12.4	11.7
8.1	4.9	2.6	1.9	2.1	1.8	1.7	1.8	2.0	3.1	10.6	12.0	10.7	5.9	1.7	1.1	1.5	1.2	2.2	9.2	11.6	5.3	2.2	7.8	10.4	11.4	12.0	12.0	9.9	7.9	4.8	8.3	9.5	10.4	11.1	8.2
6.0	7.3	6.8	4.1	2.1	1.6	1.6	1.0	1.1	1.3	4.7	9.1	8.5	6.7	4.1	1.8	1.4	1.7	1.4	4.7	3.9	2.3	1.6	2.1	2.2	3.8	5.0	4.2	2.7	1.4	1.9	3.1	3.4	3.9	3.4	3.7
5.5	8.1	6.6	7.0	6.2	6.5	6.9	5.9	3.9	3.1	3.0	7.9	10.0	7.2	6.0	5.0	4.1	3.8	3.5	6.0	6.5	5.5	3.4	2.1	2.0	2.3	1.4	1.3	1.4	1.8	2.4	3.8	3.9	2.2	3.0	3.7
6.9	7.7	6.3	5.8	6.0	6.9	8.7	9.0	7.5	6.5	7.1	9.3	12.1	8.2	6.7	6.7	7.0	6.6	5.7	5.5	7.3	8.4	6.6	5.9	5.0	4.0	3.6	2.9	3.0	3.9	4.2	5.4	4.6	4.9	6.1	7.1
6.8	6.9	5.8	5.0	4.7	5.0	4.7	5.7	6.5	7.0	7.4	9.1	8.2	8.0	7.6	6.9	6.4	6.4	6.8	6.4	6.4	6.4	7.4	6.7	6.2	5.9	5.5	4.9	5.0	5.0	5.5	5.8	6.0	5.5	6.1	7.6
6.1	6.3	6.0	6.1	5.6	5.1	5.2	4.8	5.9	6.2	6.8	8.1	7.5	7.2	7.1	5.5	4.7	5.7	5.5	5.0	5.2	5.7	6.8	6.6	6.8	6.5	5.7	5.1	5.0	5.2	5.4	6.5	6.4	6.3	6.1	6.1
5.8	5.7	6.0	5.8	5.3	5.4	5.5	5.0	5.2	5.4	5.8	8.1	10.4	9.4	8.3	6.7	5.7	5.4	4.5	3.4	3.7	4.8	6.3	6.3	6.1	5.5	5.4	5.6	6.0	6.1	6.5	6.4	5.8	5.6	5.7	5.8
5.0	5.5	5.4	6.5	7.4	7.3	7.1	6.8	8.8	8.1	8.6	9.7	8.7	8.0	7.6	7.1	6.7	5.6	4.6	3.9	4.7	4.9	5.1	4.1	4.5	4.4	3.3	4.1	4.5	4.2	3.4	2.8	3.4	4.6	6.4	4.8
6.8	7.4	8.7	9.3	9.2	7.9	6.8	6.2	6.5	5.5	5.5	6.1	6.2	6.3	6.2	5.9	4.9	5.1	5.4	3.4	2.7	2.3	2.0	2.5	2.5	2.5	2.7	2.5	2.7	2.9	3.1	3.3	3.9	5.7	6.9	6.6

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

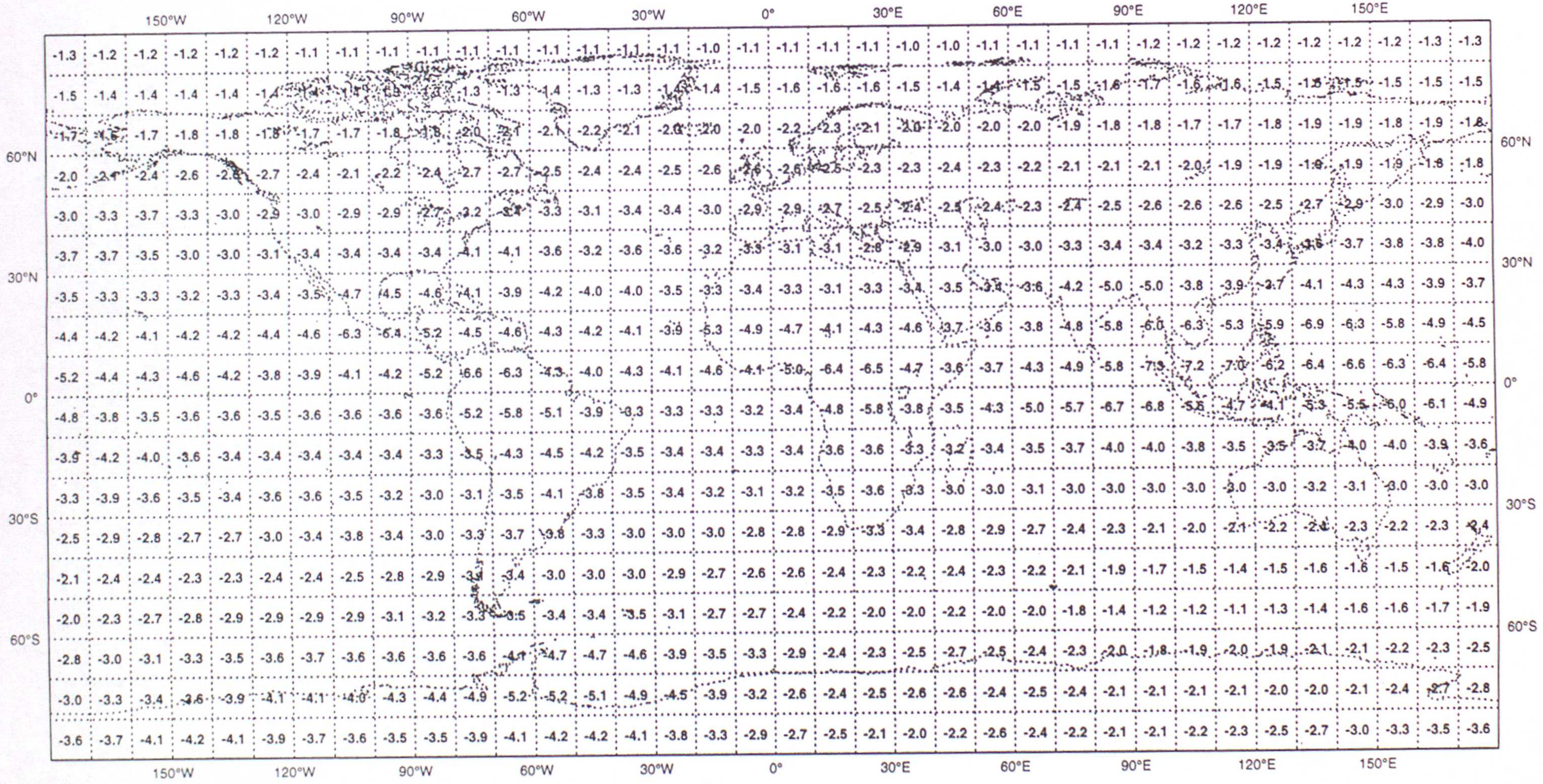
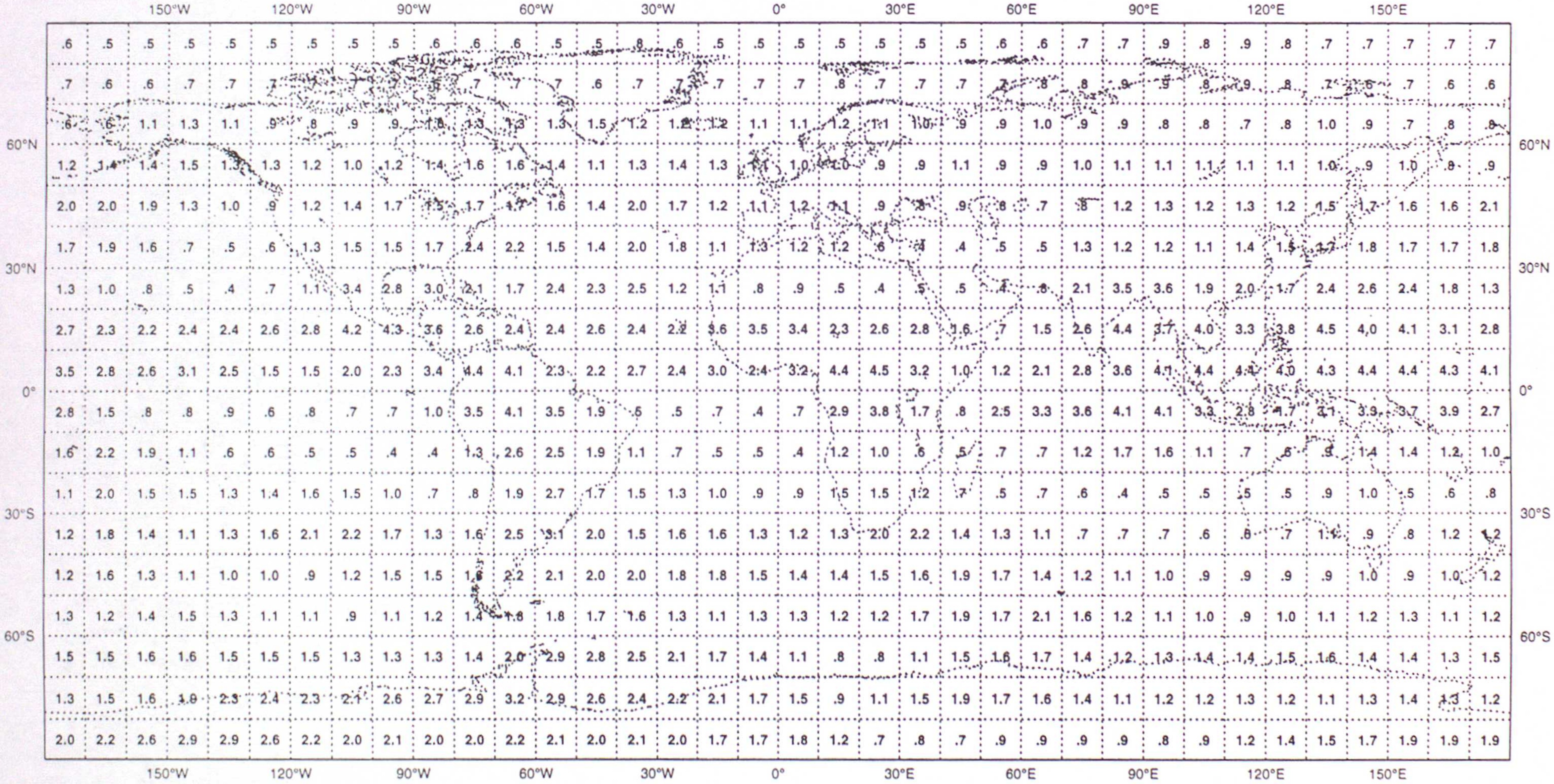

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.3 -1.2 -1.2 -1.2 -1.2 -1.2 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.0 -1.1 -1.1 -1.1 -1.1 -1.0 -1.0 -1.1 -1.1 -1.1 -1.1 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.3 -1.3
-1.5 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.3 -1.3 -1.3 -1.3 -1.4 -1.3 -1.3 -1.4 -1.4 -1.5 -1.6 -1.6 -1.6 -1.5 -1.4 -1.4 -1.5 -1.5 -1.6 -1.7 -1.6 -1.6 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5
-1.7 -1.6 -1.7 -1.8 -1.8 -1.8 -1.7 -1.7 -1.8 -1.8 -2.0 -2.1 -2.1 -2.2 -2.1 -2.0 -2.0 -2.0 -2.2 -2.3 -2.1 -2.0 -2.0 -2.0 -2.0 -1.9 -1.8 -1.8 -1.7 -1.7 -1.8 -1.9 -1.9 -1.8 -1.9 -1.8
-2.0 -2.4 -2.4 -2.6 -2.8 -2.7 -2.4 -2.1 -2.2 -2.4 -2.7 -2.7 -2.5 -2.4 -2.4 -2.5 -2.6 -2.6 -2.6 -2.5 -2.3 -2.3 -2.4 -2.3 -2.2 -2.1 -2.1 -2.1 -2.0 -1.9 -1.9 -1.9 -1.9 -1.9 -1.8 -1.8
-3.0 -3.3 -3.7 -3.3 -3.0 -2.9 -3.0 -2.9 -2.9 -2.7 -3.2 -3.4 -3.3 -3.1 -3.4 -3.4 -3.0 -2.9 -2.9 -2.7 -2.5 -2.4 -2.5 -2.4 -2.3 -2.4 -2.5 -2.6 -2.6 -2.6 -2.5 -2.7 -2.9 -3.0 -2.9 -3.0
-3.7 -3.7 -3.5 -3.0 -3.0 -3.1 -3.4 -3.4 -3.4 -3.4 -4.1 -4.1 -3.6 -3.2 -3.6 -3.6 -3.2 -3.3 -3.1 -3.1 -2.8 -2.9 -3.1 -3.0 -3.0 -3.3 -3.4 -3.4 -3.2 -3.3 -3.4 -3.6 -3.7 -3.8 -3.8 -4.0
-3.5 -3.3 -3.3 -3.2 -3.3 -3.4 -3.5 -4.7 -4.5 -4.6 -4.1 -3.9 -4.2 -4.0 -4.0 -3.5 -3.3 -3.4 -3.3 -3.1 -3.3 -3.4 -3.5 -3.4 -3.6 -4.2 -5.0 -5.0 -3.8 -3.9 -3.7 -4.1 -4.3 -4.3 -3.9 -3.7
-4.4 -4.2 -4.1 -4.2 -4.2 -4.4 -4.6 -6.3 -6.4 -5.2 -4.5 -4.6 -4.3 -4.2 -4.1 -3.9 -5.3 -4.9 -4.7 -4.1 -4.3 -4.6 -3.7 -3.6 -3.8 -4.8 -5.8 -6.0 -6.3 -5.3 -5.9 -6.9 -6.3 -5.8 -4.9 -4.5
-5.2 -4.4 -4.3 -4.6 -4.2 -3.8 -3.9 -4.1 -4.2 -5.2 -6.6 -6.3 -4.3 -4.0 -4.3 -4.1 -4.6 -4.1 -5.0 -6.4 -6.5 -4.7 -3.6 -3.7 -4.3 -4.9 -5.8 -7.3 -7.2 -7.0 -6.2 -6.4 -6.6 -6.3 -6.4 -5.8
-4.8 -3.8 -3.5 -3.6 -3.6 -3.5 -3.6 -3.6 -3.6 -3.6 -5.2 -5.8 -5.1 -3.9 -3.3 -3.3 -3.3 -3.2 -3.4 -4.8 -5.8 -3.8 -3.5 -4.3 -5.0 -5.7 -6.7 -6.8 -5.6 -4.7 -4.1 -5.3 -5.5 -6.0 -6.1 -4.9
-3.9 -4.2 -4.0 -3.6 -3.4 -3.4 -3.4 -3.4 -3.4 -3.3 -3.5 -4.3 -4.5 -4.2 -3.5 -3.4 -3.4 -3.3 -3.4 -3.6 -3.6 -3.3 -3.2 -3.4 -3.5 -3.7 -4.0 -4.0 -3.8 -3.5 -3.5 -3.7 -4.0 -4.0 -3.9 -3.6
-3.3 -3.9 -3.6 -3.5 -3.4 -3.6 -3.6 -3.5 -3.2 -3.0 -3.1 -3.5 -4.1 -3.8 -3.5 -3.4 -3.2 -3.1 -3.2 -3.5 -3.6 -3.3 -3.0 -3.0 -3.1 -3.0 -3.0 -3.0 -3.0 -3.0 -3.0 -3.2 -3.1 -3.0 -3.0 -3.0
-2.5 -2.9 -2.8 -2.7 -2.7 -3.0 -3.4 -3.8 -3.4 -3.0 -3.3 -3.7 -3.8 -3.3 -3.0 -3.0 -3.0 -2.8 -2.8 -2.9 -3.3 -3.4 -2.8 -2.9 -2.7 -2.4 -2.3 -2.1 -2.0 -2.1 -2.2 -2.4 -2.3 -2.2 -2.3 -2.4
-2.1 -2.4 -2.4 -2.3 -2.3 -2.4 -2.4 -2.5 -2.8 -2.9 -3.4 -3.4 -3.0 -3.0 -3.0 -2.9 -2.7 -2.6 -2.6 -2.4 -2.3 -2.2 -2.4 -2.3 -2.2 -2.1 -1.9 -1.7 -1.5 -1.4 -1.5 -1.6 -1.6 -1.5 -1.6 -2.0
-2.0 -2.3 -2.7 -2.8 -2.9 -2.9 -2.9 -2.9 -3.1 -3.2 -3.3 -3.5 -3.4 -3.4 -3.5 -3.1 -2.7 -2.7 -2.4 -2.2 -2.0 -2.0 -2.2 -2.0 -2.0 -1.8 -1.4 -1.2 -1.2 -1.1 -1.3 -1.4 -1.6 -1.6 -1.7 -1.9
-2.8 -3.0 -3.1 -3.3 -3.5 -3.6 -3.7 -3.6 -3.6 -3.6 -3.6 -4.1 -4.7 -4.7 -4.6 -3.9 -3.5 -3.3 -2.9 -2.4 -2.3 -2.5 -2.7 -2.5 -2.4 -2.3 -2.0 -1.8 -1.9 -2.0 -1.9 -2.1 -2.1 -2.2 -2.3 -2.5
-3.0 -3.3 -3.4 -3.6 -3.9 -4.1 -4.1 -4.0 -4.3 -4.4 -4.9 -5.2 -5.2 -5.1 -4.9 -4.5 -3.9 -3.2 -2.6 -2.4 -2.5 -2.6 -2.6 -2.4 -2.5 -2.4 -2.1 -2.1 -2.1 -2.1 -2.0 -2.0 -2.1 -2.4 -2.7 -2.8
-3.6 -3.7 -4.1 -4.2 -4.1 -3.9 -3.7 -3.6 -3.5 -3.5 -3.9 -4.1 -4.2 -4.2 -4.1 -3.8 -3.3 -2.9 -2.7 -2.5 -2.1 -2.0 -2.2 -2.6 -2.4 -2.2 -2.1 -2.1 -2.2 -2.3 -2.5 -2.7 -3.0 -3.3 -3.5 -3.6

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.8	.6	.5	.5	.5	.5	.5	.5	.5	.6	.6	.7	.7	.9	.8	.9	.8	.7	.7	.7	.7	.7
.7	.6	.6	.7	.7	.7	.7	.7	.7	.5	.7	.7	.7	.6	.7	.7	.7	.7	.8	.7	.7	.7	.7	.8	.8	.9	.9	.8	.9	.8	.7	.6	.7	.6	.6	.6
.6	.6	1.1	1.3	1.1	.9	.8	.9	.9	1.0	1.3	1.3	1.3	1.5	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.0	.9	.9	1.0	.9	.9	.8	.8	.7	.8	1.0	.9	.7	.8	.8
1.2	1.4	1.4	1.5	1.3	1.3	1.2	1.0	1.2	1.4	1.6	1.6	1.4	1.1	1.3	1.4	1.3	1.1	1.0	1.0	.9	.9	1.1	.9	.9	1.0	1.1	1.1	1.1	1.1	1.1	1.0	.9	1.0	.8	.9
2.0	2.0	1.9	1.3	1.0	.9	1.2	1.4	1.7	1.5	1.7	1.7	1.6	1.4	2.0	1.7	1.2	1.1	1.2	1.1	.9	.8	.9	.8	.7	.8	1.2	1.3	1.2	1.3	1.2	1.5	1.7	1.6	1.6	2.1
1.7	1.9	1.6	.7	.5	.6	1.3	1.5	1.5	1.7	2.4	2.2	1.5	1.4	2.0	1.8	1.1	1.3	1.2	1.2	.6	.4	.4	.5	.5	1.3	1.2	1.2	1.1	1.4	1.5	1.7	1.8	1.7	1.7	1.8
1.3	1.0	.8	.5	.4	.7	1.1	3.4	2.8	3.0	2.1	1.7	2.4	2.3	2.5	1.2	1.1	.8	.9	.5	.4	.5	.5	.4	.8	2.1	3.5	3.6	1.9	2.0	1.7	2.4	2.6	2.4	1.8	1.3
2.7	2.3	2.2	2.4	2.4	2.6	2.8	4.2	4.3	3.6	2.6	2.4	2.4	2.6	2.4	2.2	3.6	3.5	3.4	2.3	2.6	2.8	1.6	.7	1.5	2.6	4.4	3.7	4.0	3.3	3.8	4.5	4.0	4.1	3.1	2.8
3.5	2.8	2.6	3.1	2.5	1.5	1.5	2.0	2.3	3.4	4.4	4.1	2.3	2.2	2.7	2.4	3.0	2.4	3.2	4.4	4.5	3.2	1.0	1.2	2.1	2.8	3.6	4.1	4.4	4.4	4.0	4.3	4.4	4.4	4.3	4.1
2.8	1.5	.8	.8	.9	.6	.8	.7	.7	1.0	3.5	4.1	3.5	1.9	.6	.5	.7	.4	.7	2.9	3.8	1.7	.8	2.5	3.3	3.6	4.1	4.1	3.3	2.8	4.7	3.1	3.9	3.7	3.9	2.7
1.6	2.2	1.9	1.1	.6	.6	.5	.5	.4	.4	1.3	2.6	2.5	1.9	1.1	.7	.5	.5	.4	1.2	1.0	.6	.5	.7	.7	1.2	1.7	1.6	1.1	.7	.6	.9	1.4	1.4	1.2	1.0
1.1	2.0	1.5	1.5	1.3	1.4	1.6	1.5	1.0	.7	.8	1.9	2.7	1.7	1.5	1.3	1.0	.9	.9	1.5	1.5	1.2	.7	.5	.7	.6	.4	.5	.5	.5	.5	.9	1.0	.5	.6	.8
1.2	1.8	1.4	1.1	1.3	1.6	2.1	2.2	1.7	1.3	1.6	2.5	3.1	2.0	1.5	1.6	1.6	1.3	1.2	1.3	2.0	2.2	1.4	1.3	1.1	.7	.7	.7	.6	.6	.7	1.1	.9	.8	1.2	1.2
1.2	1.6	1.3	1.1	1.0	1.0	.9	1.2	1.5	1.5	1.6	2.2	2.1	2.0	2.0	1.8	1.8	1.5	1.4	1.4	1.5	1.6	1.9	1.7	1.4	1.2	1.1	1.0	.9	.9	.9	.9	1.0	.9	1.0	1.2
1.3	1.2	1.4	1.5	1.3	1.1	1.1	.9	1.1	1.2	1.4	1.8	1.8	1.7	1.6	1.3	1.1	1.3	1.3	1.2	1.2	1.7	1.9	1.7	2.1	1.6	1.2	1.1	1.0	.9	1.0	1.1	1.2	1.3	1.1	1.2
1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.3	1.3	1.3	1.4	2.0	2.9	2.8	2.5	2.1	1.7	1.4	1.1	.8	.8	1.1	1.5	1.6	1.7	1.4	1.2	1.3	1.4	1.4	1.5	1.6	1.4	1.4	1.3	1.5
1.3	1.5	1.6	1.9	2.3	2.4	2.3	2.1	2.6	2.7	2.9	3.2	2.9	2.6	2.4	2.2	2.1	1.7	1.5	.9	1.1	1.5	1.9	1.7	1.6	1.4	1.1	1.2	1.2	1.3	1.2	1.1	1.3	1.4	1.3	1.2
2.0	2.2	2.6	2.9	2.9	2.6	2.2	2.0	2.1	2.0	2.0	2.2	2.1	2.0	2.1	2.0	1.7	1.7	1.8	1.2	.7	.8	.7	.9	.9	.9	.9	.8	.9	1.2	1.4	1.5	1.7	1.9	1.9	1.9

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

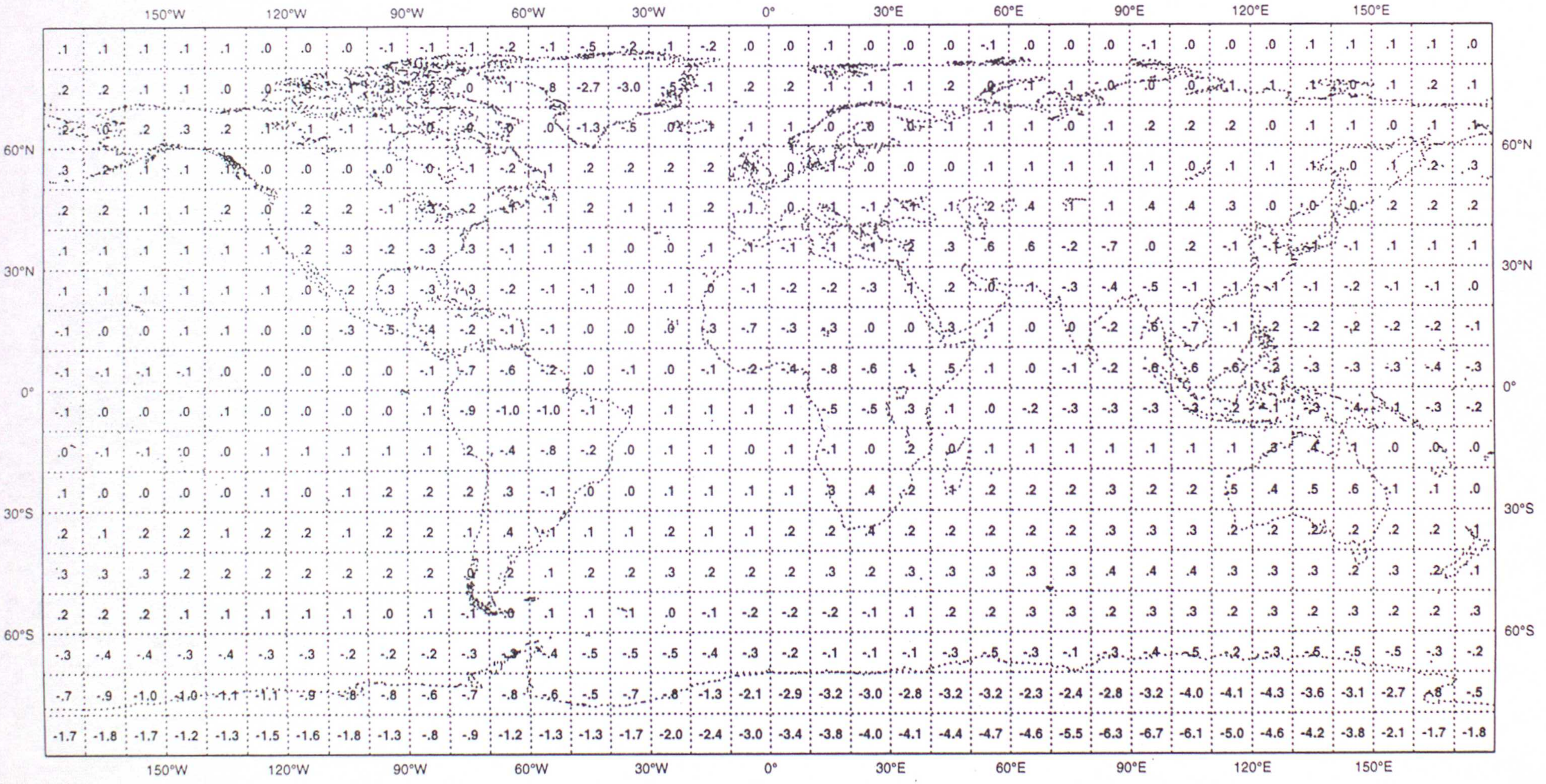

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.1 .1 .1 .1 .1 .0 .0 .0 -.1 -.1 -.1 -.2 -.1 -.5 -.2 .1 -.2 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .0 -.1 .0 .0 .0 .1 .1 .1 .1 .0
.2 .2 .1 .1 .0 .0 .6 .1 .3 .2 .0 .1 .8 -2.7 -3.0 -.5 .1 .2 .2 .1 .1 .1 .2 .0 .1 .1 .0 .0 .0 .1 .1 .1 .0 .1 .2 .1
.2 .0 .2 .3 .2 .1 -.1 -.1 -.1 .0 .0 .0 .0 -1.3 -.5 .0 .1 .1 .1 .0 .0 .0 .1 .1 .1 .0 .1 .2 .2 .2 .0 .1 .1 .0 .1 .1
.3 .2 .1 .1 .1 .0 .0 .0 .0 .0 -.1 -.2 .1 .2 .2 .2 .2 [illegible] .0 .1 .0 .0 .0 .1 .1 .1 .1 .1 .0 .1 .1 .1 .0 .1 .2 .3
.2 .2 .1 .1 .2 .0 .2 .2 -.1 -.3 .2 .1 .1 .2 .1 .1 .2 .1 .0 -.1 -.1 -.1 .1 .2 .4 .1 .1 .4 .4 .3 .0 .0 .0 .2 .2 .2
.1 .1 .1 .1 .1 .1 .2 .3 -.2 -.3 .3 -.1 .1 .1 .0 .0 .1 .1 -.1 -.1 -.1 .2 .3 .6 .6 -.2 -.7 .0 .2 -.1 -.1 -.1 -.1 .1 .1 .1
.1 .1 .1 .1 .1 .1 .0 -.2 -.3 -.3 -.3 -.2 -.1 -.1 .0 .1 .0 -.1 -.2 -.2 -.3 .1 .2 .0 .1 -.3 -.4 -.5 -.1 -.1 -.1 -.1 -.2 -.1 -.1 .0
-.1 .0 .0 .1 .1 .0 .0 -.3 -.5 -.4 -.2 -.1 -.1 .0 .0 .0 .3 -.7 -.3 .3 .0 .0 .3 .1 .0 .0 -.2 -.6 -.7 -.1 -.2 -.2 -.2 -.2 -.2 -.1
-.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 -.1 -.7 -.6 -.2 .0 -.1 .0 -.1 -.2 -.4 -.8 -.6 .1 .5 .1 .0 -.1 -.2 -.8 -.6 -.6 -.2 -.3 -.3 -.3 -.4 -.3
-.1 .0 .0 .0 .1 .0 .0 .0 .0 .1 -.9 -1.0 -1.0 -.1 -.1 .1 .1 .1 .1 -.5 -.5 .3 .1 .0 -.2 -.3 -.3 -.3 -.3 -.2 -.1 -.3 -.4 -.1 -.3 -.2
.0 -.1 -.1 .0 .0 .1 .1 .1 .1 .1 .2 -.4 -.8 -.2 .0 .1 .1 .0 .1 -.1 .0 .2 .0 .1 .1 .1 .1 .1 .1 .1 .3 .4 .1 .0 .0 .0
.1 .0 .0 .0 .0 .1 .0 .1 .2 .2 .2 .3 -.1 .0 .0 .1 .1 .1 .1 .3 .4 .2 .1 .2 .2 .2 .3 .2 .2 .5 .4 .5 .6 .1 .1 .0
.2 .1 .2 .2 .1 .2 .2 .1 .2 .2 .1 .4 .1 .1 .1 .2 .1 .1 .2 .2 .4 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2 .2 .1
.3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .0 .2 .1 .2 .2 .3 .2 .2 .2 .3 .2 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .2 .3 .2 .1
.2 .2 .2 .1 .1 .1 .1 .1 .0 .1 -.1 .0 .1 .1 .1 .0 -.1 -.2 -.2 -.2 -.1 .1 .2 .2 .3 .3 .2 .3 .3 .2 .3 .2 .3 .2 .2 .3
-.3 -.4 -.4 -.3 -.4 -.3 -.3 -.2 -.2 -.2 -.3 -.3 -.4 -.5 -.5 -.5 -.4 -.3 -.2 -.1 -.1 -.1 -.3 -.5 -.3 -.1 -.3 -.4 -.5 -.2 -.3 -.6 -.5 -.5 -.3 -.2
-.7 -.9 -1.0 -1.0 -1.1 -1.1 -.9 -.8 -.8 -.6 -.7 -.8 -.6 -.5 -.7 -.8 -1.3 -2.1 -2.9 -3.2 -3.0 -2.8 -3.2 -3.2 -2.3 -2.4 -2.8 -3.2 -4.0 -4.1 -4.3 -3.6 -3.1 -2.7 -.8 -.5
-1.7 -1.8 -1.7 -1.2 -1.3 -1.5 -1.6 -1.8 -1.3 -.8 -.9 -1.2 -1.3 -1.3 -1.7 -2.0 -2.4 -3.0 -3.4 -3.8 -4.0 -4.1 -4.4 -4.7 -4.6 -5.5 -6.3 -6.7 -6.1 -5.0 -4.6 -4.2 -3.8 -2.1 -1.7 -1.8

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

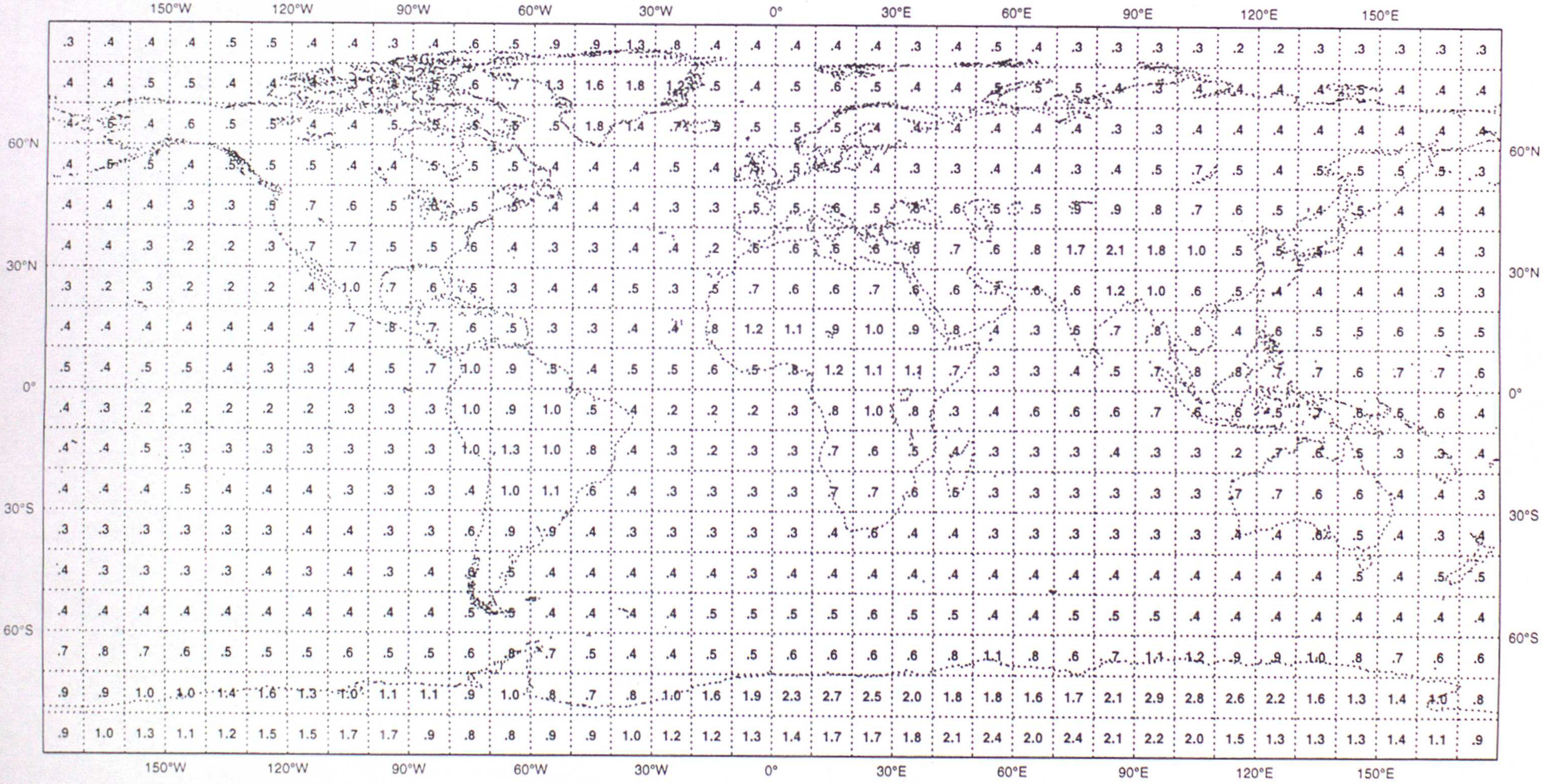

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

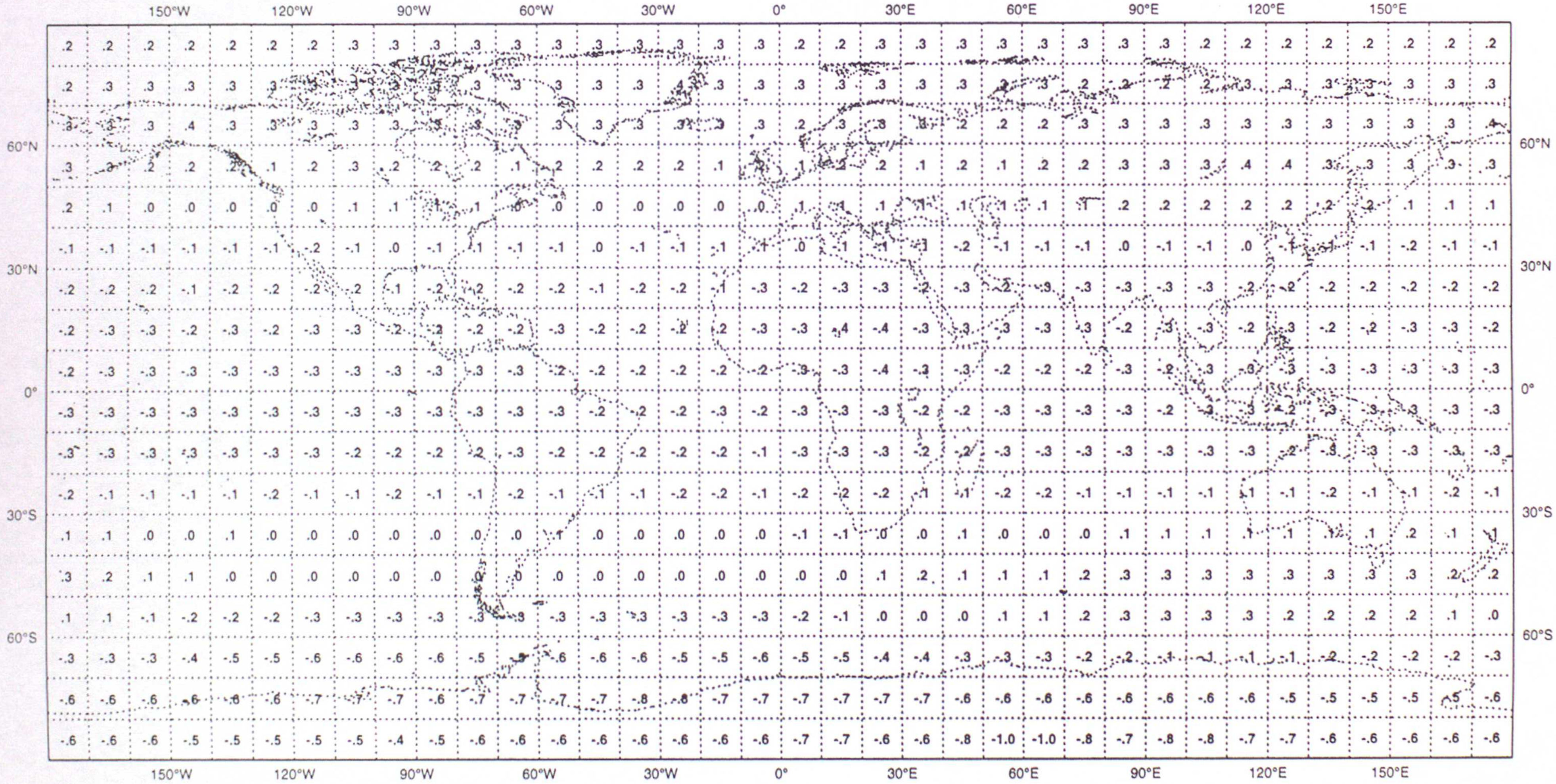

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

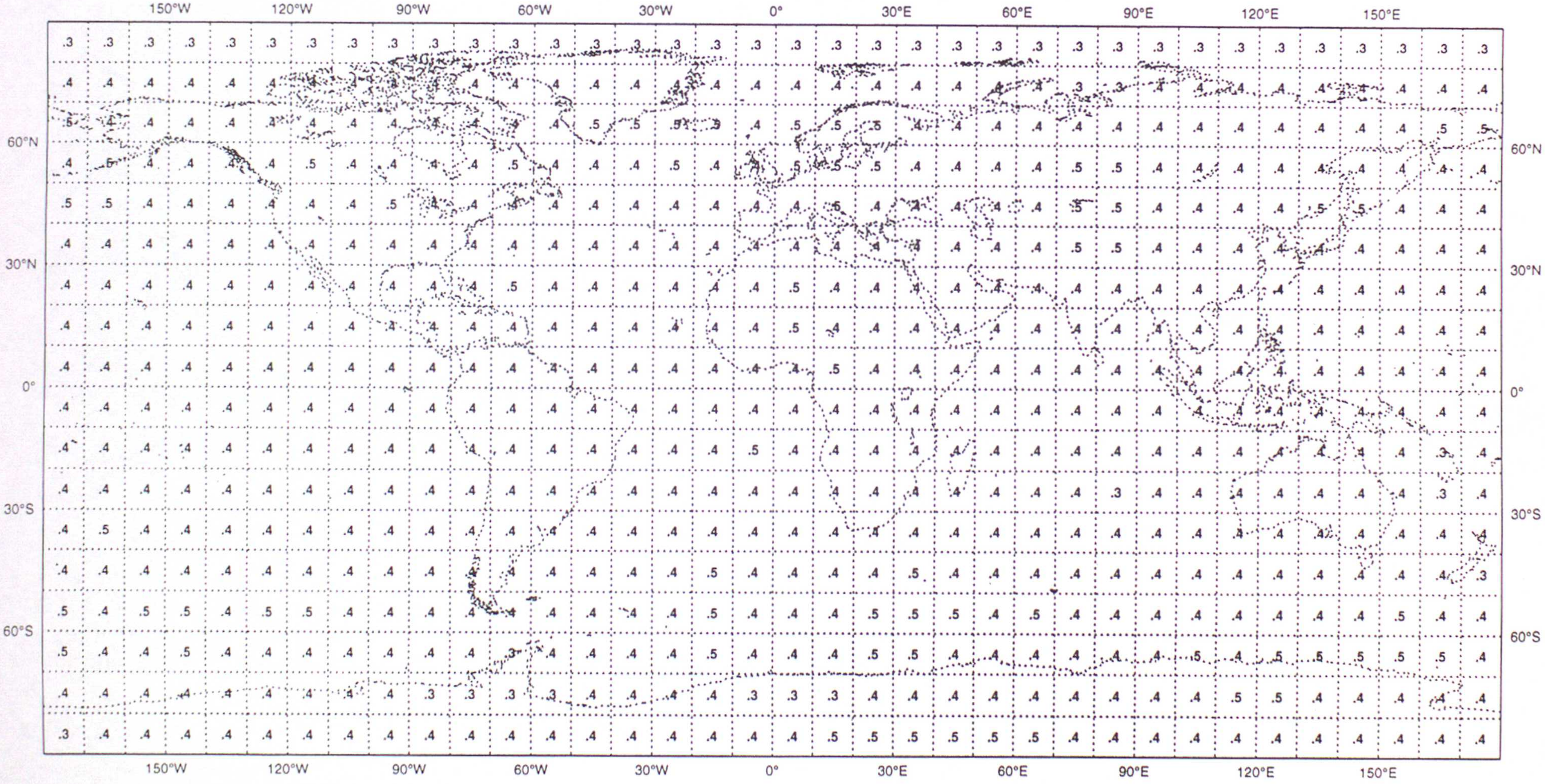

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

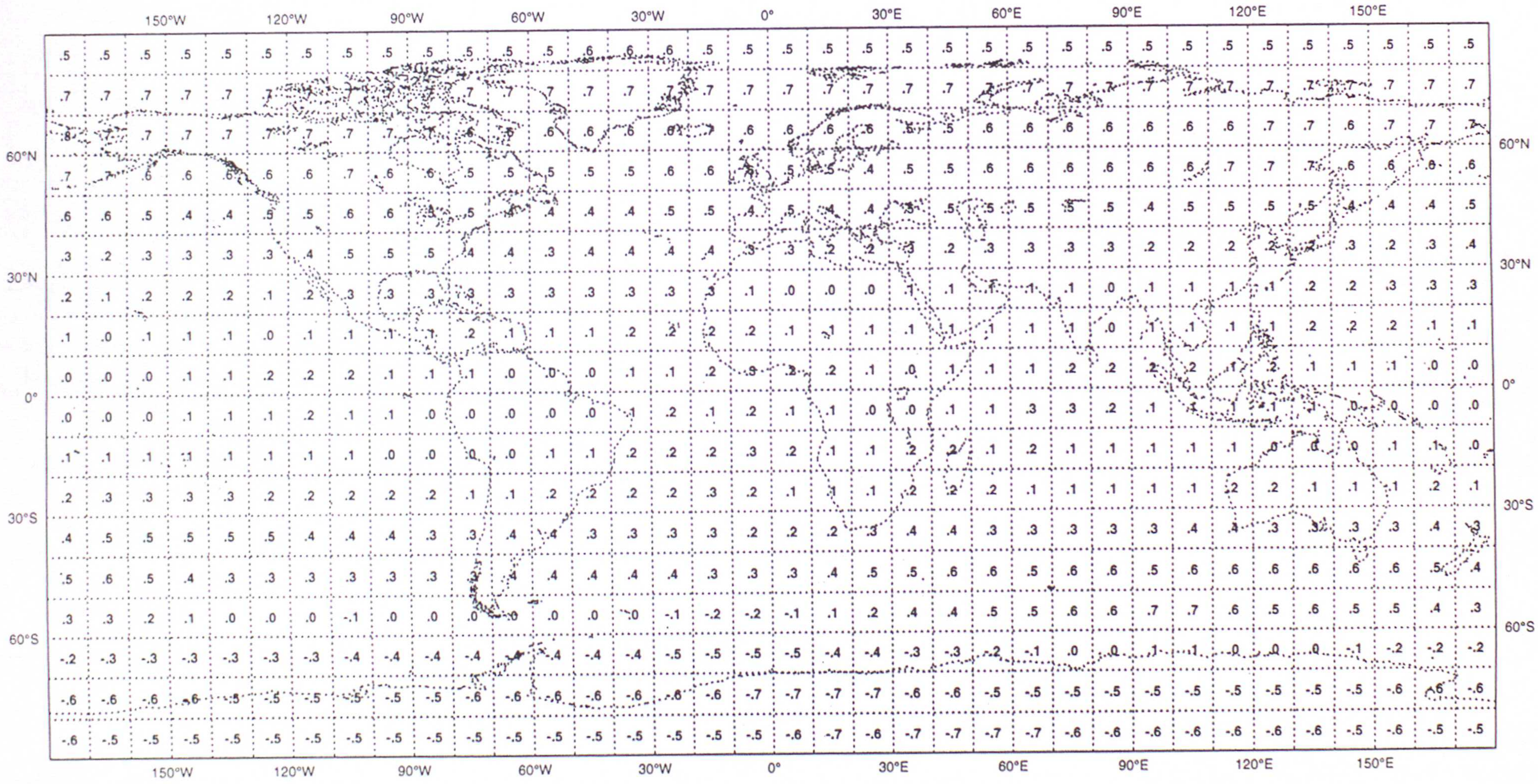

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7
.8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .7 .6 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .7 .7 .7
.7 .7 .6 .6 .6 .6 .6 .7 .6 .6 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .4 .5 .5 .6 .6 .6 .6 .6 .6 .7 .7 .7 .6 .6 .6 .6
.6 .6 .5 .4 .4 .5 .5 .6 .6 .5 .5 .4 .4 .4 .4 .5 .5 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .5
.3 .2 .3 .3 .3 .3 .4 .5 .5 .5 .4 .4 .3 .4 .4 .4 .4 .3 .3 .2 .2 .3 .2 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .2 .3 .4
.2 .1 .2 .2 .2 .1 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .1 .0 .0 .0 .1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .2 .2 .3 .3 .3
.1 .0 .1 .1 .1 .0 .1 .1 .1 .1 .2 .1 .1 .1 .2 .2 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .2 .2 .2 .1 .1
.0 .0 .0 .1 .1 .2 .2 .2 .1 .1 .1 .0 .0 .0 .1 .1 .2 .3 .2 .2 .1 .0 .1 .1 .1 .2 .2 .2 .2 .1 .2 .1 .1 .1 .0 .0
.0 .0 .0 .1 .1 .1 .2 .1 .1 .0 .0 .0 .0 .0 .1 .2 .1 .2 .1 .1 .0 .0 .1 .1 .3 .3 .2 .1 .1 .1 .1 .1 .0 .0 .0 .0
.1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .1 .2 .2 .2 .3 .2 .1 .1 .2 .2 .1 .2 .1 .1 .1 .1 .1 .0 .0 .0 .1 .1 .0
.2 .3 .3 .3 .3 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .2 .3 .2 .1 .1 .1 .2 .2 .2 .1 .1 .1 .1 .1 .2 .2 .1 .1 .1 .2 .1
.4 .5 .5 .5 .5 .5 .4 .4 .4 .3 .3 .4 .4 .3 .3 .3 .3 .2 .2 .2 .3 .4 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .4 .3
.5 .6 .5 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .4 .5 .5 .6 .6 .5 .6 .6 .5 .6 .6 .6 .6 .6 .6 .5 .4
.3 .3 .2 .1 .0 .0 .0 -.1 .0 .0 .0 .0 .0 .0 .0 -.1 -.2 -.2 -.1 .1 .2 .4 .4 .5 .5 .6 .6 .7 .7 .6 .5 .6 .5 .5 .4 .3
-.2 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.4 -.4 -.3 -.3 -.2 -.1 .0 .0 .1 .1 .0 .0 .0 -.1 -.2 -.2 -.2
-.6 -.6 -.6 -.6 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.7 -.7 -.7 -.7 -.6 -.6 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.6 -.6
-.6 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.7 -.6 -.7 -.7 -.7 -.7 -.6 -.6 -.6 -.6 -.6 -.6 -.6 -.5 -.6 -.5 -.5

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

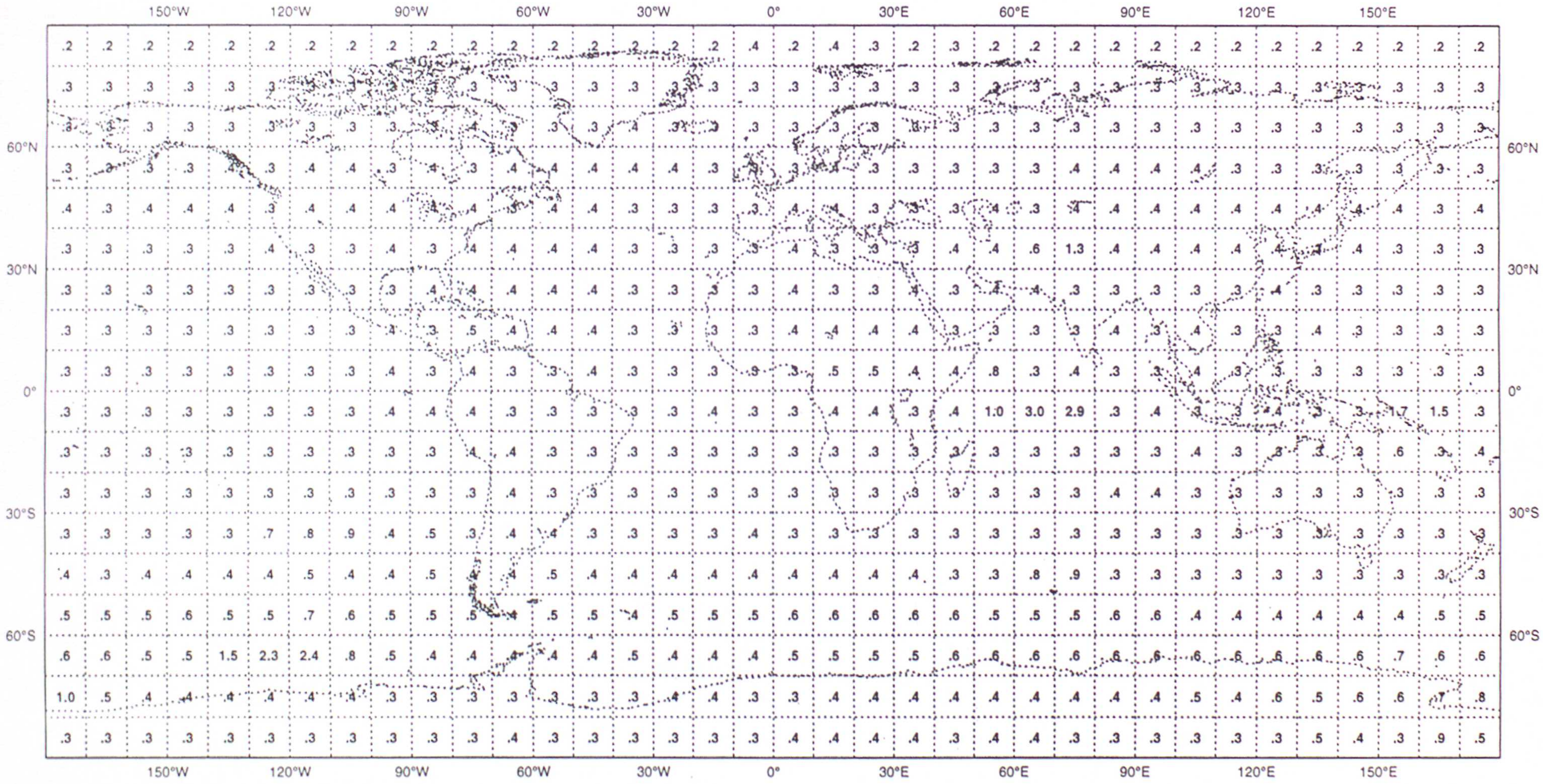
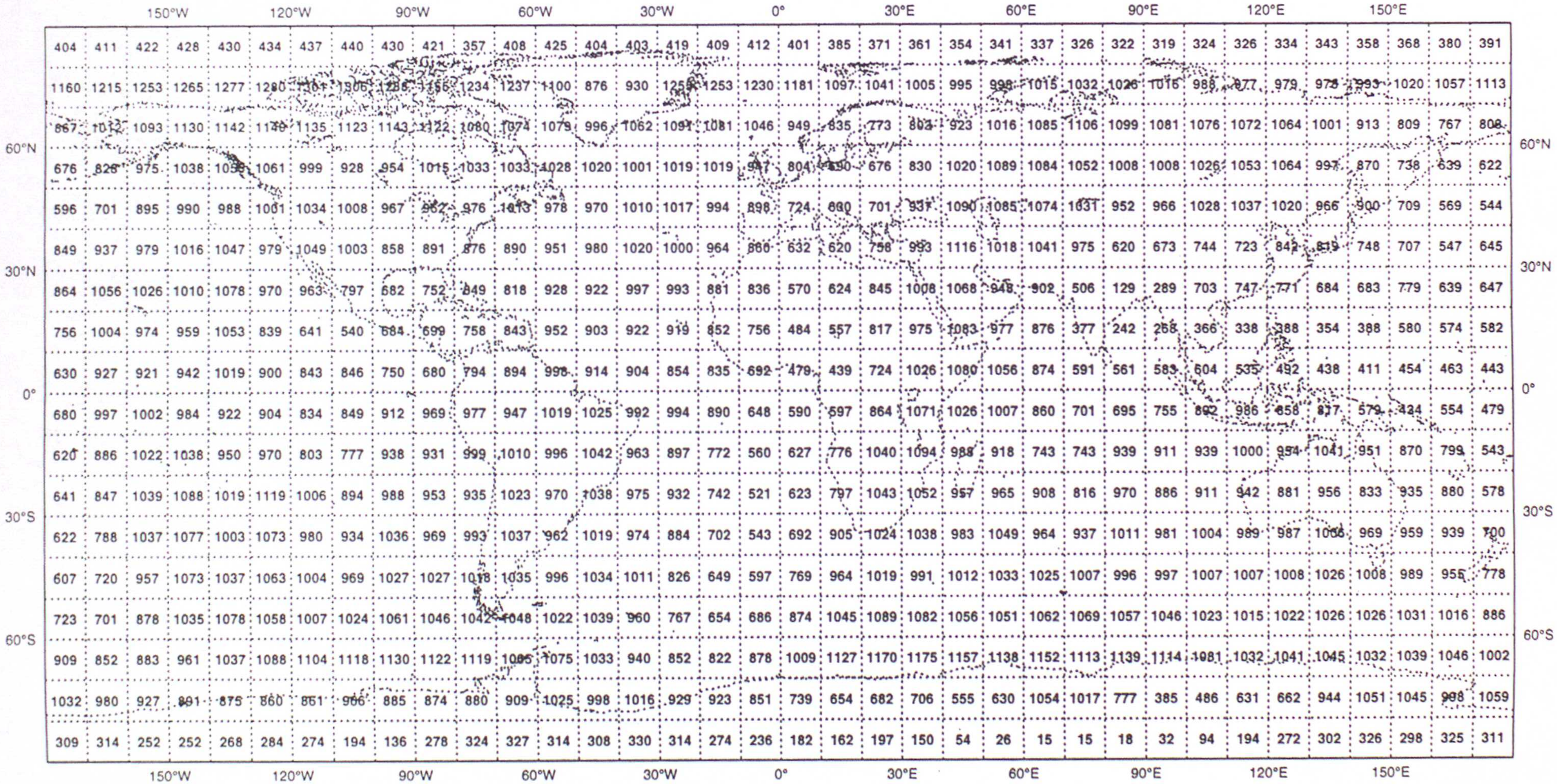

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 55. ATOVS mean daily count. SEPTEMBER 2003
NOAA17, using all observations
Global average number of observations in 24 hours = 544270



404	411	422	428	430	434	437	440	430	421	357	408	425	404	403	419	409	412	401	385	371	361	354	341	337	326	322	319	324	326	334	343	358	368	380	391
1160	1215	1253	1265	1277	1280	1301	1306	1286	1156	1234	1237	1100	876	930	1258	1253	1230	1181	1097	1041	1005	995	998	1015	1032	1026	1016	988	977	979	978	993	1020	1057	1113
867	1012	1093	1130	1142	1140	1135	1123	1143	1122	1080	1074	1079	996	1062	1091	1081	1046	949	835	773	803	923	1016	1085	1106	1099	1081	1076	1072	1064	1001	913	809	767	808
676	828	975	1038	1058	1061	999	928	954	1015	1033	1033	1028	1020	1001	1019	1019	947	804	690	676	830	1020	1089	1084	1052	1008	1008	1026	1053	1064	997	870	738	639	622
596	701	895	990	988	1001	1034	1008	967	962	976	1013	978	970	1010	1017	994	898	724	680	701	937	1090	1085	1074	1031	952	966	1028	1037	1020	966	900	709	569	544
849	937	979	1016	1047	979	1049	1003	858	891	876	890	951	980	1020	1000	964	860	632	620	758	993	1116	1018	1041	975	620	673	744	723	842	819	748	707	547	645
864	1056	1026	1010	1078	970	963	797	682	752	849	818	928	922	997	993	881	836	570	624	845	1008	1068	948	902	506	129	289	703	747	771	684	683	779	639	647
756	1004	974	959	1053	839	641	540	684	699	758	843	952	903	922	919	852	756	484	557	817	975	1083	977	876	377	242	268	366	338	388	354	388	580	574	582
630	927	921	942	1019	900	843	846	750	680	794	894	998	914	904	854	835	692	479	439	724	1026	1080	1056	874	591	561	583	604	535	492	438	411	454	463	443
680	997	1002	984	922	904	834	849	912	969	977	947	1019	1025	992	994	890	648	590	597	864	1071	1026	1007	860	701	695	755	892	986	658	837	579	434	554	479
620	886	1022	1038	950	970	803	777	938	931	999	1010	996	1042	963	897	772	560	627	776	1040	1094	988	918	743	743	939	911	939	1000	954	1041	951	870	799	543
641	847	1039	1088	1019	1119	1006	894	988	953	935	1023	970	1038	975	932	742	521	623	797	1043	1052	957	965	908	816	970	886	911	942	881	956	833	935	880	578
622	788	1037	1077	1003	1073	980	934	1036	969	993	1037	962	1019	974	884	702	543	692	905	1024	1038	983	1049	964	937	1011	981	1004	989	987	1066	969	959	939	700
607	720	957	1073	1037	1063	1004	969	1027	1027	1018	1035	996	1034	1011	826	649	597	769	964	1019	991	1012	1033	1025	1007	996	997	1007	1007	1008	1026	1008	989	955	778
723	701	878	1035	1078	1058	1007	1024	1061	1046	1042	1048	1022	1039	960	767	654	686	874	1045	1089	1082	1056	1051	1062	1069	1057	1046	1023	1015	1022	1026	1026	1031	1016	886
909	852	883	961	1037	1088	1104	1118	1130	1122	1119	1085	1075	1033	940	852	822	878	1009	1127	1170	1175	1157	1138	1152	1113	1139	1114	1081	1032	1041	1045	1032	1039	1046	1002
1032	980	927	891	875	860	861	906	885	874	880	909	1025	998	1016	929	923	851	739	654	682	706	555	630	1054	1017	777	385	486	631	662	944	1051	1045	998	1059
309	314	252	252	268	284	274	194	136	278	324	327	314	308	330	314	274	236	182	162	197	150	54	26	15	15	18	32	94	194	272	302	326	298	325	311

Figure 56. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS8 (Surface)
NOAA17, using all observations

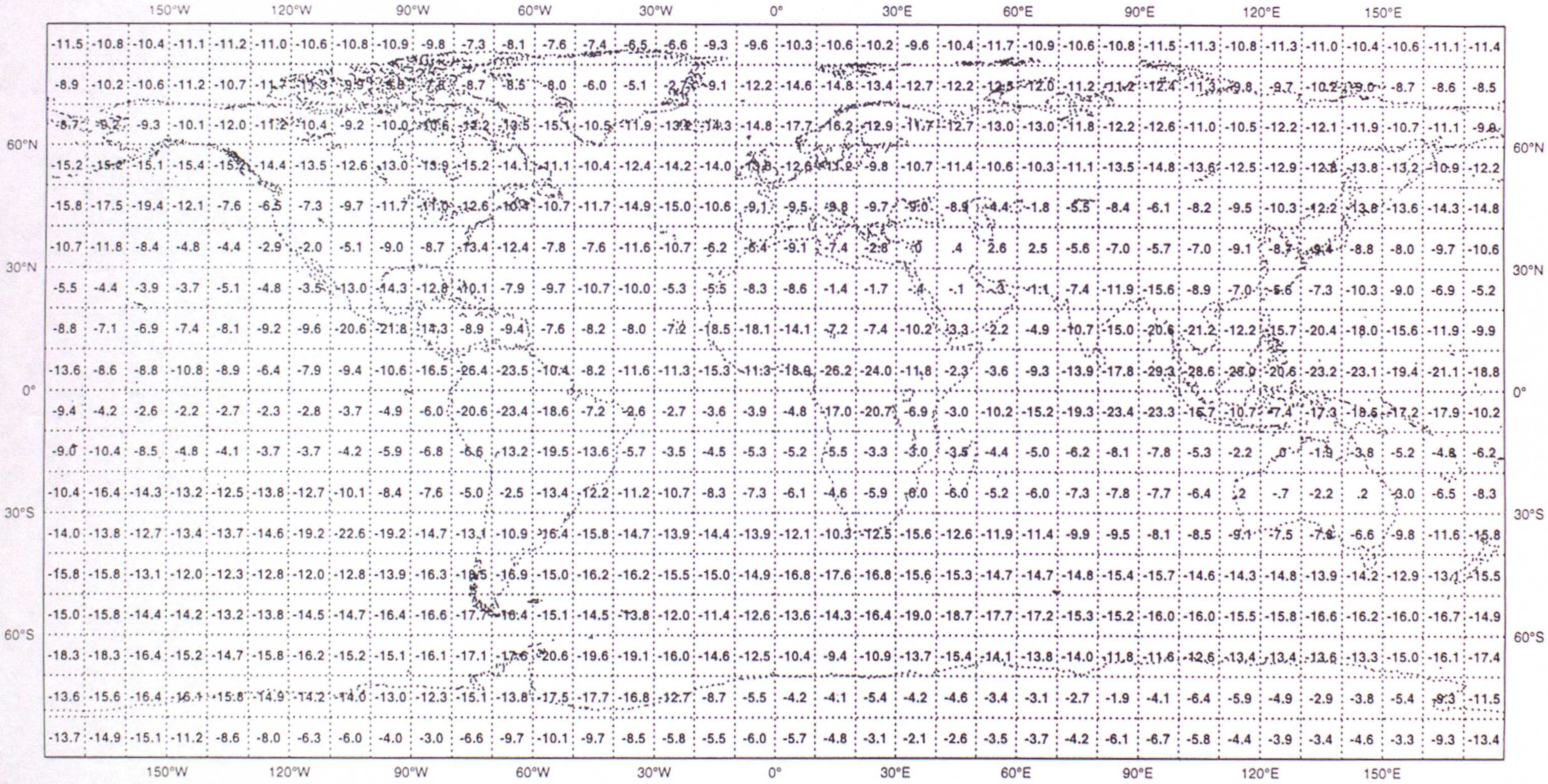
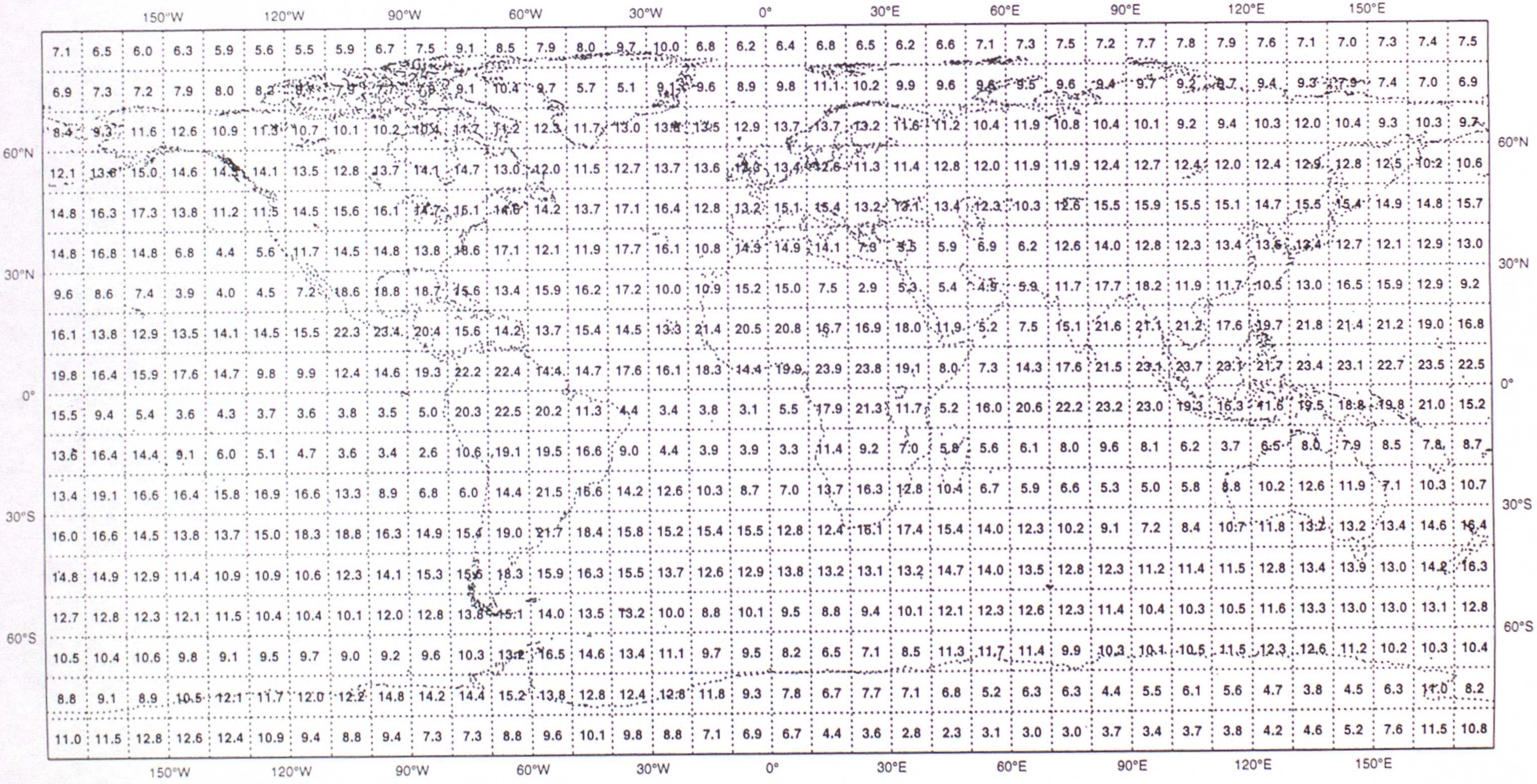
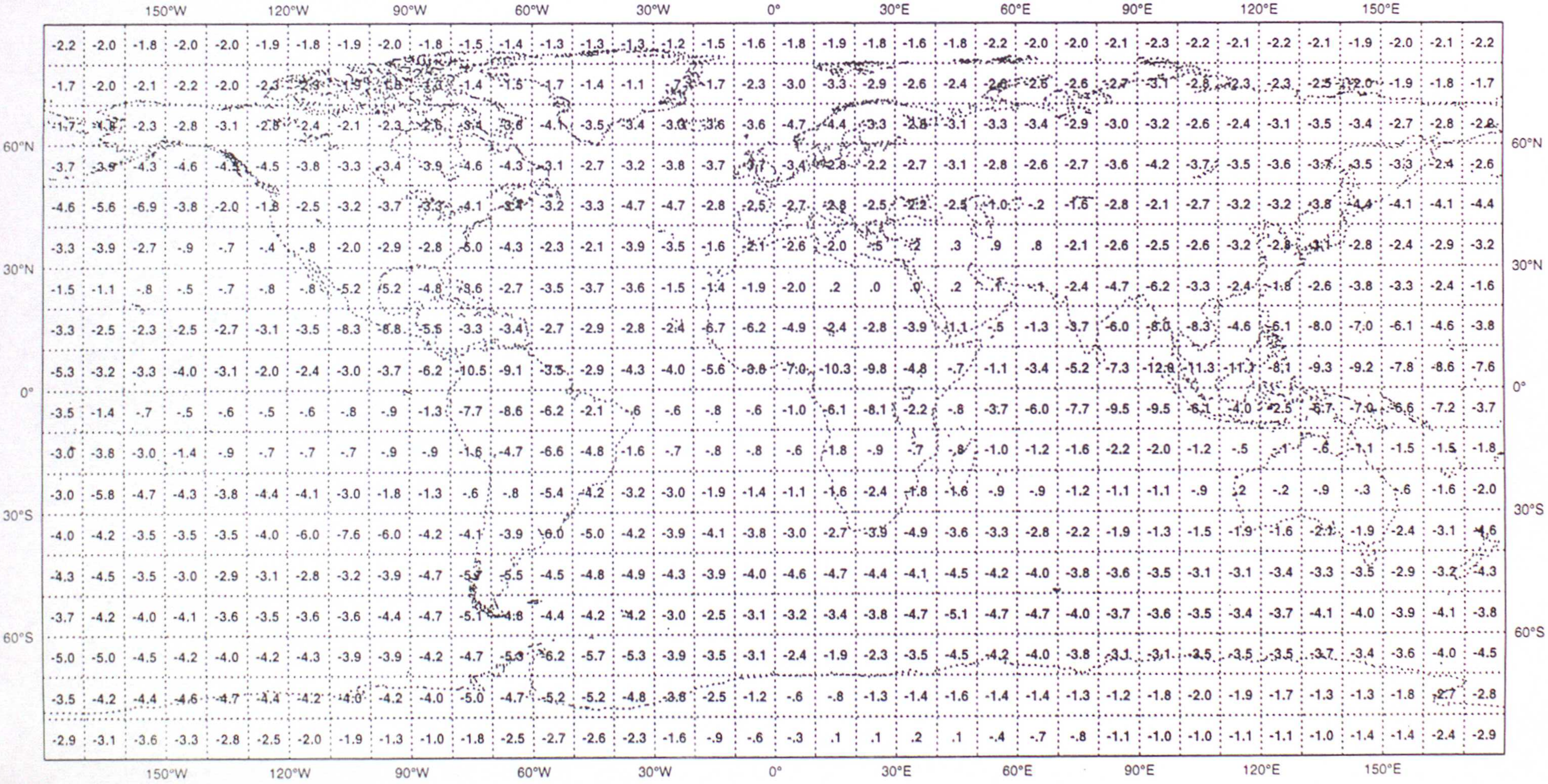

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-11.5 -10.8 -10.4 -11.1 -11.2 -11.0 -10.6 -10.8 -10.9 -9.8 -7.3 -8.1 -7.6 -7.4 -6.5 -6.6 -9.3 -9.6 -10.3 -10.6 -10.2 -9.6 -10.4 -11.7 -10.9 -10.6 -10.8 -11.5 -11.3 -10.8 -11.3 -11.0 -10.4 -10.6 -11.1 -11.4
-8.9 -10.2 -10.6 -11.2 -10.7 -11.7 -11.3 -9.9 -5.8 -7.8 -8.7 -8.5 -8.0 -6.0 -5.1 -2.7 -9.1 -12.2 -14.6 -14.8 -13.4 -12.7 -12.2 -12.5 -12.0 -11.2 -11.2 -12.4 -11.3 -9.8 -9.7 -10.2 -9.0 -8.7 -8.6 -8.5
-8.7 -9.2 -9.3 -10.1 -12.0 -11.2 -10.4 -9.2 -10.0 -10.6 -12.2 -13.5 -15.1 -10.5 -11.9 -13.2 -14.3 -14.8 -17.7 -16.2 -12.9 -11.7 -12.7 -13.0 -13.0 -11.8 -12.2 -12.6 -11.0 -10.5 -12.2 -12.1 -11.9 -10.7 -11.1 -9.8
-15.2 -15.2 -15.1 -15.4 -15.2 -14.4 -13.5 -12.6 -13.0 -13.9 -15.2 -14.1 -11.1 -10.4 -12.4 -14.2 -14.0 -13.8 -12.6 -11.2 -9.8 -10.7 -11.4 -10.6 -10.3 -11.1 -13.5 -14.8 -13.6 -12.5 -12.9 -12.8 -13.8 -13.2 -10.9 -12.2
-15.8 -17.5 -19.4 -12.1 -7.6 -6.5 -7.3 -9.7 -11.7 -11.0 -12.6 -10.4 -10.7 -11.7 -14.9 -15.0 -10.6 -9.1 -9.5 -9.8 -9.7 -9.0 -8.9 -4.4 -1.8 -5.5 -8.4 -6.1 -8.2 -9.5 -10.3 -12.2 -13.8 -13.6 -14.3 -14.8
-10.7 -11.8 -8.4 -4.8 -4.4 -2.9 -2.0 -5.1 -9.0 -8.7 -13.4 -12.4 -7.8 -7.6 -11.6 -10.7 -6.2 -6.4 -9.1 -7.4 -2.8 .0 .4 2.6 2.5 -5.6 -7.0 -5.7 -7.0 -9.1 -8.7 -9.4 -8.8 -8.0 -9.7 -10.6
-5.5 -4.4 -3.9 -3.7 -5.1 -4.8 -3.5 -13.0 -14.3 -12.8 -10.1 -7.9 -9.7 -10.7 -10.0 -5.3 -5.5 -8.3 -8.6 -1.4 -1.7 -.4 -.1 -.3 -1.1 -7.4 -11.9 -15.6 -8.9 -7.0 -5.6 -7.3 -10.3 -9.0 -6.9 -5.2
-8.8 -7.1 -6.9 -7.4 -8.1 -9.2 -9.6 -20.6 -21.8 -14.3 -8.9 -9.4 -7.6 -8.2 -8.0 -7.2 -18.5 -18.1 -14.1 -7.2 -7.4 -10.2 -3.3 -2.2 -4.9 -10.7 -15.0 -20.6 -21.2 -12.2 -15.7 -20.4 -18.0 -15.6 -11.9 -9.9
-13.6 -8.6 -8.8 -10.8 -8.9 -6.4 -7.9 -9.4 -10.6 -16.5 -26.4 -23.5 -10.4 -8.2 -11.6 -11.3 -15.3 -11.3 -18.8 -26.2 -24.0 -11.8 -2.3 -3.6 -9.3 -13.9 -17.8 -29.3 -28.6 -28.0 -20.6 -23.2 -23.1 -19.4 -21.1 -18.8
-9.4 -4.2 -2.6 -2.2 -2.7 -2.3 -2.8 -3.7 -4.9 -6.0 -20.6 -23.4 -18.6 -7.2 -2.6 -2.7 -3.6 -3.9 -4.8 -17.0 -20.7 -6.9 -3.0 -10.2 -15.2 -19.3 -23.4 -23.3 -16.7 -10.7 -7.4 -17.3 -18.6 -17.2 -17.9 -10.2
-9.0 -10.4 -8.5 -4.8 -4.1 -3.7 -3.7 -4.2 -5.9 -6.8 -6.6 -13.2 -19.5 -13.6 -5.7 -3.5 -4.5 -5.3 -5.2 -5.5 -3.3 -3.0 -3.5 -4.4 -5.0 -6.2 -8.1 -7.8 -5.3 -2.2 .0 -1.9 -3.8 -5.2 -4.8 -6.2
-10.4 -16.4 -14.3 -13.2 -12.5 -13.8 -12.7 -10.1 -8.4 -7.6 -5.0 -2.5 -13.4 -12.2 -11.2 -10.7 -8.3 -7.3 -6.1 -4.6 -5.9 -6.0 -6.0 -5.2 -6.0 -7.3 -7.8 -7.7 -6.4 .2 -.7 -2.2 .2 -3.0 -6.5 -8.3
-14.0 -13.8 -12.7 -13.4 -13.7 -14.6 -19.2 -22.6 -19.2 -14.7 -13.1 -10.9 -16.4 -15.8 -14.7 -13.9 -14.4 -13.9 -12.1 -10.3 -12.5 -15.6 -12.6 -11.9 -11.4 -9.9 -9.5 -8.1 -8.5 -9.1 -7.5 -7.8 -6.6 -9.8 -11.6 -15.8
-15.8 -15.8 -13.1 -12.0 -12.3 -12.8 -12.0 -12.8 -13.9 -16.3 -18.5 -16.9 -15.0 -16.2 -16.2 -15.5 -15.0 -14.9 -16.8 -17.6 -16.8 -15.6 -15.3 -14.7 -14.7 -14.8 -15.4 -15.7 -14.6 -14.3 -14.8 -13.9 -14.2 -12.9 -13.1 -15.5
-15.0 -15.8 -14.4 -14.2 -13.2 -13.8 -14.5 -14.7 -16.4 -16.6 -17.7 -16.4 -15.1 -14.5 -13.8 -12.0 -11.4 -12.6 -13.6 -14.3 -16.4 -19.0 -18.7 -17.7 -17.2 -15.3 -15.2 -16.0 -16.0 -15.5 -15.8 -16.6 -16.2 -16.0 -16.7 -14.9
-18.3 -18.3 -16.4 -15.2 -14.7 -15.8 -16.2 -15.2 -15.1 -16.1 -17.1 -17.6 -20.6 -19.6 -19.1 -16.0 -14.6 -12.5 -10.4 -9.4 -10.9 -13.7 -15.4 -14.1 -13.8 -14.0 -11.8 -11.6 -12.6 -13.4 -13.4 -13.6 -13.3 -15.0 -16.1 -17.4
-13.6 -15.6 -16.4 -16.1 -15.8 -14.9 -14.2 -14.0 -13.0 -12.3 -15.1 -13.8 -17.5 -17.7 -16.8 -12.7 -8.7 -5.5 -4.2 -4.1 -5.4 -4.2 -4.6 -3.4 -3.1 -2.7 -1.9 -4.1 -6.4 -5.9 -4.9 -2.9 -3.8 -5.4 -9.3 -11.5
-13.7 -14.9 -15.1 -11.2 -8.6 -8.0 -6.3 -6.0 -4.0 -3.0 -6.6 -9.7 -10.1 -9.7 -8.5 -5.8 -5.5 -6.0 -5.7 -4.8 -3.1 -2.1 -2.6 -3.5 -3.7 -4.2 -6.1 -6.7 -5.8 -4.4 -3.9 -3.4 -4.6 -3.3 -9.3 -13.4

Figure 57. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS8 (Surface)
NOAA17, using all observations



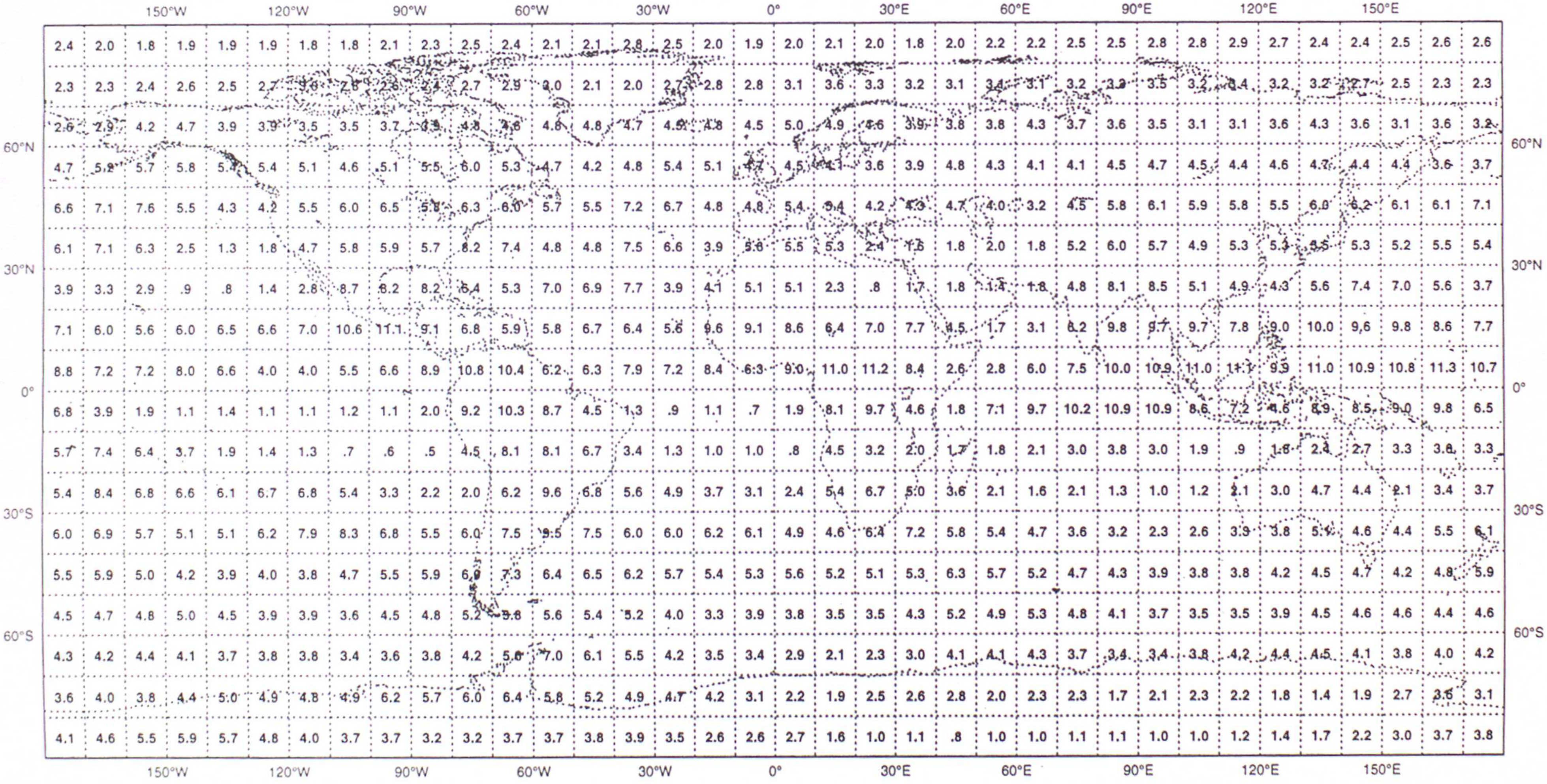
7.1	6.5	6.0	6.3	5.9	5.6	5.5	5.9	6.7	7.5	9.1	8.5	7.9	8.0	9.7	10.0	6.8	6.2	6.4	6.8	6.5	6.2	6.6	7.1	7.3	7.5	7.2	7.7	7.8	7.9	7.6	7.1	7.0	7.3	7.4	7.5
6.9	7.3	7.2	7.9	8.0	8.2	8.7	7.9	7.7	6.9	9.1	10.4	9.7	5.7	5.1	9.1	9.6	8.9	9.8	11.1	10.2	9.9	9.6	9.6	9.5	9.6	9.4	9.7	9.2	8.7	9.4	9.3	7.9	7.4	7.0	6.9
8.4	9.3	11.6	12.6	10.9	11.3	10.7	10.1	10.2	10.4	11.7	11.2	12.3	11.7	13.0	13.8	13.5	12.9	13.7	13.7	13.2	11.6	11.2	10.4	11.9	10.8	10.4	10.1	9.2	9.4	10.3	12.0	10.4	9.3	10.3	9.7
12.1	13.6	15.0	14.6	14.5	14.1	13.5	12.8	13.7	14.1	14.7	13.0	12.0	11.5	12.7	13.7	13.6	14.0	13.4	12.6	11.3	11.4	12.8	12.0	11.9	11.9	12.4	12.7	12.4	12.0	12.4	12.9	12.8	12.5	10.2	10.6
14.8	16.3	17.3	13.8	11.2	11.5	14.5	15.6	16.1	14.7	15.1	14.6	14.2	13.7	17.1	16.4	12.8	13.2	15.1	15.4	13.2	13.1	13.4	12.3	10.3	12.6	15.5	15.9	15.5	15.1	14.7	15.5	15.4	14.9	14.8	15.7
14.8	16.8	14.8	6.8	4.4	5.6	11.7	14.5	14.8	13.8	18.6	17.1	12.1	11.9	17.7	16.1	10.8	14.9	14.9	14.1	7.8	5.5	5.9	6.9	6.2	12.6	14.0	12.8	12.3	13.4	13.6	13.4	12.7	12.1	12.9	13.0
9.6	8.6	7.4	3.9	4.0	4.5	7.2	18.6	18.8	18.7	15.6	13.4	15.9	16.2	17.2	10.0	10.9	15.2	15.0	7.5	2.9	5.3	5.4	4.9	5.9	11.7	17.7	18.2	11.9	11.7	10.5	13.0	16.5	15.9	12.9	9.2
16.1	13.8	12.9	13.5	14.1	14.5	15.5	22.3	23.4	20.4	15.6	14.2	13.7	15.4	14.5	13.3	21.4	20.5	20.8	16.7	16.9	18.0	11.9	5.2	7.5	15.1	21.6	21.1	21.2	17.6	19.7	21.8	21.4	21.2	19.0	16.8
19.8	16.4	15.9	17.6	14.7	9.8	9.9	12.4	14.6	19.3	22.2	22.4	14.4	14.7	17.6	16.1	18.3	14.4	19.9	23.9	23.8	19.1	8.0	7.3	14.3	17.6	21.5	23.1	23.7	23.1	21.7	23.4	23.1	22.7	23.5	22.5
15.5	9.4	5.4	3.6	4.3	3.7	3.6	3.8	3.5	5.0	20.3	22.5	20.2	11.3	4.4	3.4	3.8	3.1	5.5	17.9	21.3	11.7	5.2	16.0	20.6	22.2	23.2	23.0	19.3	16.3	11.6	19.5	18.8	19.8	21.0	15.2
13.6	16.4	14.4	9.1	6.0	5.1	4.7	3.6	3.4	2.6	10.6	19.1	19.5	16.6	9.0	4.4	3.9	3.9	3.3	11.4	9.2	7.0	5.8	5.6	6.1	8.0	9.6	8.1	6.2	3.7	6.5	8.0	7.9	8.5	7.8	8.7
13.4	19.1	16.6	16.4	15.8	16.9	16.6	13.3	8.9	6.8	6.0	14.4	21.5	16.6	14.2	12.6	10.3	8.7	7.0	13.7	16.3	12.8	10.4	6.7	5.9	6.6	5.3	5.0	5.8	8.8	10.2	12.6	11.9	7.1	10.3	10.7
16.0	16.6	14.5	13.8	13.7	15.0	18.3	18.8	16.3	14.9	15.4	19.0	21.7	18.4	15.8	15.2	15.4	15.5	12.8	12.4	16.1	17.4	15.4	14.0	12.3	10.2	9.1	7.2	8.4	10.7	11.8	13.2	13.2	13.4	14.6	16.4
14.8	14.9	12.9	11.4	10.9	10.9	10.6	12.3	14.1	15.3	15.6	18.3	15.9	16.3	15.5	13.7	12.6	12.9	13.8	13.2	13.1	13.2	14.7	14.0	13.5	12.8	12.3	11.2	11.4	11.5	12.8	13.4	13.9	13.0	14.2	16.3
12.7	12.8	12.3	12.1	11.5	10.4	10.4	10.1	12.0	12.8	13.8	15.1	14.0	13.5	13.2	10.0	8.8	10.1	9.5	8.8	9.4	10.1	12.1	12.3	12.6	12.3	11.4	10.4	10.3	10.5	11.6	13.3	13.0	13.0	13.1	12.8
10.5	10.4	10.6	9.8	9.1	9.5	9.7	9.0	9.2	9.6	10.3	13.2	16.5	14.6	13.4	11.1	9.7	9.5	8.2	6.5	7.1	8.5	11.3	11.7	11.4	9.9	10.3	10.1	10.5	11.5	12.3	12.6	11.2	10.2	10.3	10.4
8.8	9.1	8.9	10.5	12.1	11.7	12.0	12.2	14.8	14.2	14.4	15.2	13.8	12.8	12.4	12.8	11.8	9.3	7.8	6.7	7.7	7.1	6.8	5.2	6.3	6.3	4.4	5.5	6.1	5.6	4.7	3.8	4.5	6.3	11.0	8.2
11.0	11.5	12.8	12.6	12.4	10.9	9.4	8.8	9.4	7.3	7.3	8.8	9.6	10.1	9.8	8.8	7.1	6.9	6.7	4.4	3.6	2.8	2.3	3.1	3.0	3.0	3.7	3.4	3.7	3.8	4.2	4.6	5.2	7.6	11.5	10.8

Figure 58. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA17, using all observations



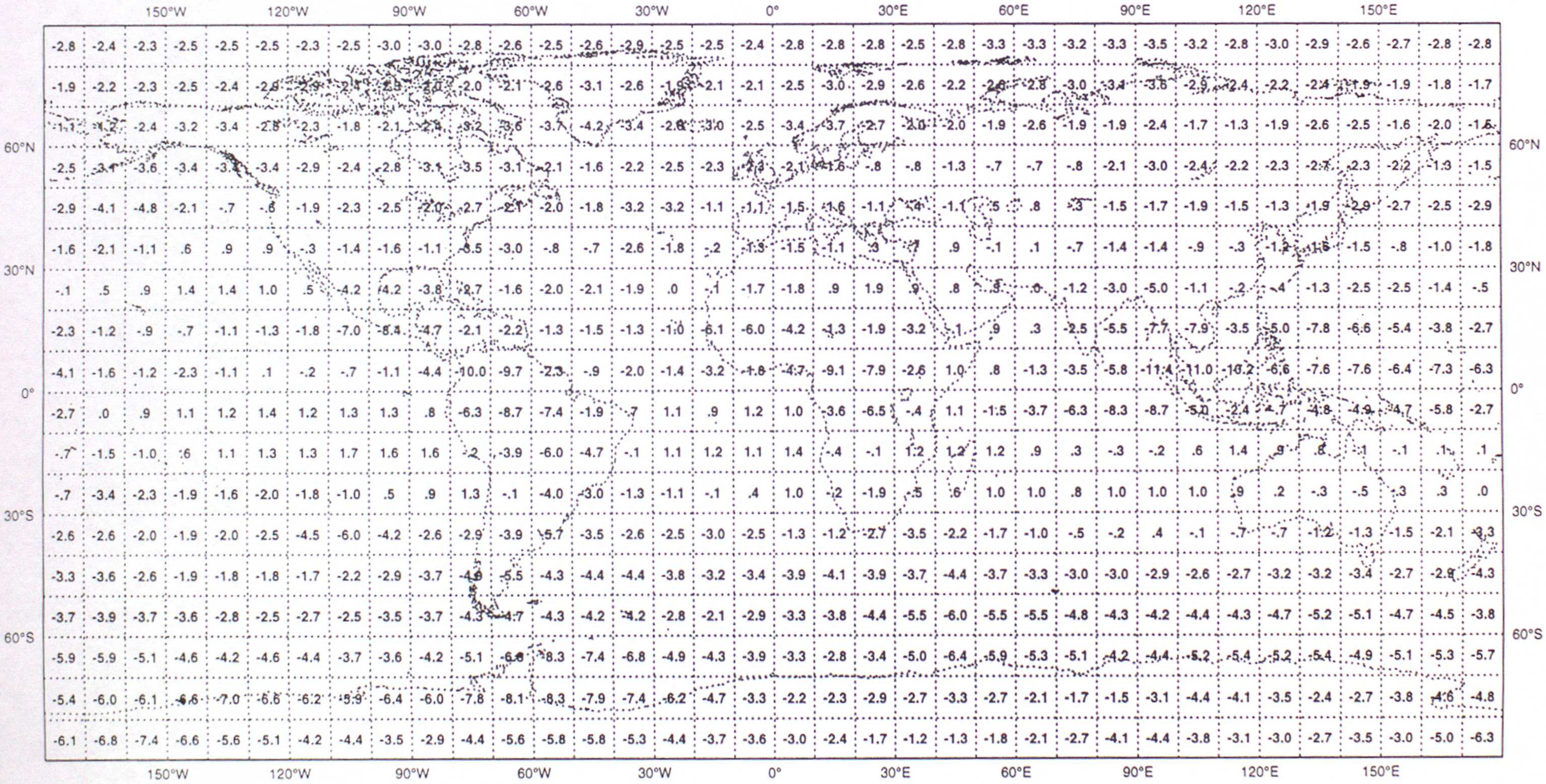
-2.2	-2.0	-1.8	-2.0	-2.0	-1.9	-1.8	-1.9	-2.0	-1.8	-1.5	-1.4	-1.3	-1.3	-1.3	-1.2	-1.5	-1.6	-1.8	-1.9	-1.8	-1.6	-1.8	-2.2	-2.0	-2.0	-2.1	-2.3	-2.2	-2.1	-2.2	-2.1	-1.9	-2.0	-2.1	-2.2
-1.7	-2.0	-2.1	-2.2	-2.0	-2.3	-2.3	-1.9	-1.8	-1.3	-1.4	-1.5	-1.7	-1.4	-1.1	-.7	-1.7	-2.3	-3.0	-3.3	-2.9	-2.6	-2.4	-2.6	-2.5	-2.6	-2.7	-3.1	-2.8	-2.3	-2.3	-2.5	-2.0	-1.9	-1.8	-1.7
-1.7	-1.8	-2.3	-2.8	-3.1	-2.8	-2.4	-2.1	-2.3	-2.6	-3.4	-3.6	-4.1	-3.5	-3.4	-3.0	-3.6	-3.6	-4.7	-4.4	-3.3	-2.8	-3.1	-3.3	-3.4	-2.9	-3.0	-3.2	-2.6	-2.4	-3.1	-3.5	-3.4	-2.7	-2.8	-2.8
-3.7	-3.9	-4.3	-4.6	-4.5	-4.5	-3.8	-3.3	-3.4	-3.9	-4.6	-4.3	-3.1	-2.7	-3.2	-3.8	-3.7	-3.7	-3.4	-2.8	-2.2	-2.7	-3.1	-2.8	-2.6	-2.7	-3.6	-4.2	-3.7	-3.5	-3.6	-3.7	-3.5	-3.3	-2.4	-2.6
-4.6	-5.6	-6.9	-3.8	-2.0	-1.8	-2.5	-3.2	-3.7	-3.3	-4.1	-2.4	-3.2	-3.3	-4.7	-4.7	-2.8	-2.5	-2.7	-2.8	-2.5	-2.2	-2.5	-1.0	-.2	-1.6	-2.8	-2.1	-2.7	-3.2	-3.2	-3.8	-4.4	-4.1	-4.1	-4.4
-3.3	-3.9	-2.7	-.9	-.7	-.4	-.8	-2.0	-2.9	-2.8	-5.0	-4.3	-2.3	-2.1	-3.9	-3.5	-1.6	-2.1	-2.6	-2.0	-.5	.2	.3	.9	.8	-2.1	-2.6	-2.5	-2.6	-3.2	-2.8	-4.1	-2.8	-2.4	-2.9	-3.2
-1.5	-1.1	-.8	-.5	-.7	-.8	-.8	-5.2	-5.2	-4.8	-3.6	-2.7	-3.5	-3.7	-3.6	-1.5	-1.4	-1.9	-2.0	.2	.0	.0	.2	.1	-.1	-2.4	-4.7	-6.2	-3.3	-2.4	-1.8	-2.6	-3.8	-3.3	-2.4	-1.6
-3.3	-2.5	-2.3	-2.5	-2.7	-3.1	-3.5	-8.3	-8.8	-5.5	-3.3	-3.4	-2.7	-2.9	-2.8	-2.4	-6.7	-6.2	-4.9	-2.4	-2.8	-3.9	-1.1	-.5	-1.3	-3.7	-6.0	-8.0	-8.3	-4.6	-6.1	-8.0	-7.0	-6.1	-4.6	-3.8
-5.3	-3.2	-3.3	-4.0	-3.1	-2.0	-2.4	-3.0	-3.7	-6.2	-10.5	-9.1	-3.5	-2.9	-4.3	-4.0	-5.6	-3.8	-7.0	-10.3	-9.8	-4.8	-.7	-1.1	-3.4	-5.2	-7.3	-12.8	-11.3	-11.7	-8.1	-9.3	-9.2	-7.8	-8.6	-7.6
-3.5	-1.4	-.7	-.5	-.6	-.5	-.6	-.8	-.9	-1.3	-7.7	-8.6	-6.2	-2.1	-.6	-.6	-.8	-.6	-1.0	-6.1	-8.1	-2.2	-.8	-3.7	-6.0	-7.7	-9.5	-9.5	-6.1	-4.0	-2.5	-6.7	-7.0	-6.6	-7.2	-3.7
-3.0	-3.8	-3.0	-1.4	-.9	-.7	-.7	-.7	-.9	-.9	-1.6	-4.7	-6.6	-4.8	-1.6	-.7	-.8	-.8	-.6	-1.8	-.9	-.7	-.8	-1.0	-1.2	-1.6	-2.2	-2.0	-1.2	-.5	-.1	-.6	-1.1	-1.5	-1.5	-1.8
-3.0	-5.8	-4.7	-4.3	-3.8	-4.4	-4.1	-3.0	-1.8	-1.3	-.6	-.8	-5.4	-4.2	-3.2	-3.0	-1.9	-1.4	-1.1	-1.6	-2.4	-1.8	-1.6	-.9	-.9	-1.2	-1.1	-1.1	-.9	.2	-.2	-.9	-.3	-.6	-1.6	-2.0
-4.0	-4.2	-3.5	-3.5	-3.5	-4.0	-6.0	-7.6	-6.0	-4.2	-4.1	-3.9	-6.0	-5.0	-4.2	-3.9	-4.1	-3.8	-3.0	-2.7	-3.9	-4.9	-3.6	-3.3	-2.8	-2.2	-1.9	-1.3	-1.5	-1.9	-1.6	-2.1	-1.9	-2.4	-3.1	-4.6
-4.3	-4.5	-3.5	-3.0	-2.9	-3.1	-2.8	-3.2	-3.9	-4.7	-5.7	-5.5	-4.5	-4.8	-4.9	-4.3	-3.9	-4.0	-4.6	-4.7	-4.4	-4.1	-4.5	-4.2	-4.0	-3.8	-3.6	-3.5	-3.1	-3.1	-3.4	-3.3	-3.5	-2.9	-3.2	-4.3
-3.7	-4.2	-4.0	-4.1	-3.6	-3.5	-3.6	-3.6	-4.4	-4.7	-5.1	-4.8	-4.4	-4.2	-4.2	-3.0	-2.5	-3.1	-3.2	-3.4	-3.8	-4.7	-5.1	-4.7	-4.7	-4.0	-3.7	-3.6	-3.5	-3.4	-3.7	-4.1	-4.0	-3.9	-4.1	-3.8
-5.0	-5.0	-4.5	-4.2	-4.0	-4.2	-4.3	-3.9	-3.9	-4.2	-4.7	-5.3	-6.2	-5.7	-5.3	-3.9	-3.5	-3.1	-2.4	-1.9	-2.3	-3.5	-4.5	-4.2	-4.0	-3.8	-3.1	-3.1	-3.5	-3.5	-3.5	-3.7	-3.4	-3.6	-4.0	-4.5
-3.5	-4.2	-4.4	-4.6	-4.7	-4.4	-4.2	-4.0	-4.2	-4.0	-5.0	-4.7	-5.2	-5.2	-4.8	-3.8	-2.5	-1.2	-.6	-.8	-1.3	-1.4	-1.6	-1.4	-1.4	-1.3	-1.2	-1.8	-2.0	-1.9	-1.7	-1.3	-1.3	-1.8	-2.7	-2.8
-2.9	-3.1	-3.6	-3.3	-2.8	-2.5	-2.0	-1.9	-1.3	-1.0	-1.8	-2.5	-2.7	-2.6	-2.3	-1.6	-.9	-.6	-.3	.1	.1	.2	.1	-.4	-.7	-.8	-1.1	-1.0	-1.0	-1.1	-1.1	-1.0	-1.4	-1.4	-2.4	-2.9

Figure 59. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS15 (700 hPa)
NOAA17, using all observations



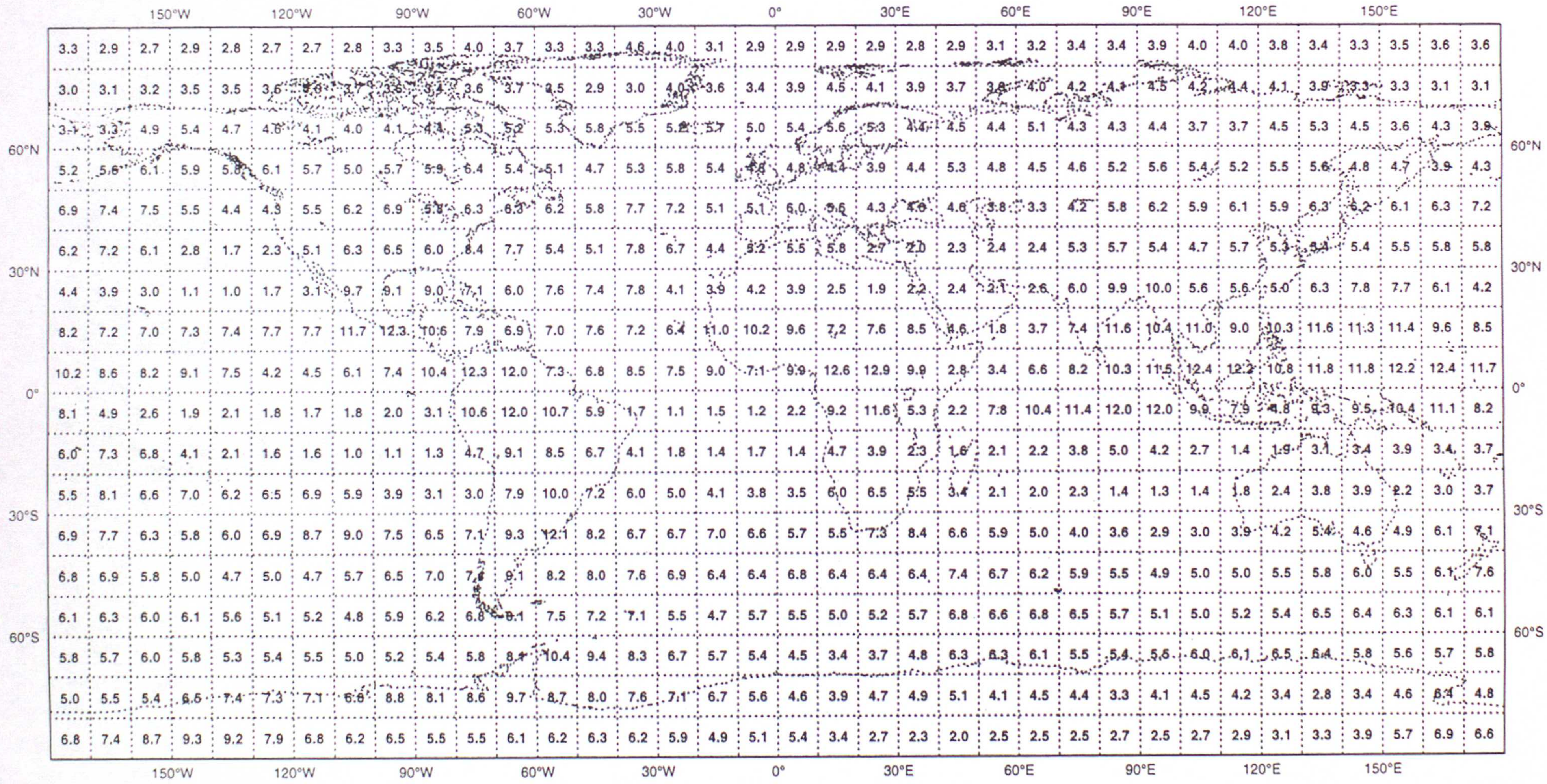
2.4	2.0	1.8	1.9	1.9	1.9	1.8	1.8	2.1	2.3	2.5	2.4	2.1	2.1	2.8	2.5	2.0	1.9	2.0	2.1	2.0	1.8	2.0	2.2	2.2	2.5	2.5	2.8	2.8	2.9	2.7	2.4	2.4	2.5	2.6	2.6
2.3	2.3	2.4	2.6	2.5	2.7	3.6	2.8	2.6	2.4	2.7	2.9	3.0	2.1	2.0	2.7	2.8	2.8	3.1	3.6	3.3	3.2	3.1	3.4	3.1	3.2	3.3	3.5	3.2	3.4	3.2	3.2	2.7	2.5	2.3	2.3
2.6	2.9	4.2	4.7	3.9	3.9	3.5	3.5	3.7	3.9	4.8	4.6	4.8	4.8	4.7	4.9	4.8	4.5	5.0	4.9	4.6	3.9	3.8	3.8	4.3	3.7	3.6	3.5	3.1	3.1	3.6	4.3	3.6	3.1	3.6	3.2
4.7	5.2	5.7	5.8	5.4	5.4	5.1	4.6	5.1	5.5	6.0	5.3	4.7	4.2	4.8	5.4	5.1	4.7	4.5	4.1	3.6	3.9	4.8	4.3	4.1	4.1	4.5	4.7	4.5	4.4	4.6	4.7	4.4	4.4	3.6	3.7
6.6	7.1	7.6	5.5	4.3	4.2	5.5	6.0	6.5	5.8	6.3	6.0	5.7	5.5	7.2	6.7	4.8	4.8	5.4	5.4	4.2	4.3	4.7	4.0	3.2	4.5	5.8	6.1	5.9	5.8	5.5	6.0	6.2	6.1	6.1	7.1
6.1	7.1	6.3	2.5	1.3	1.8	4.7	5.8	5.9	5.7	8.2	7.4	4.8	4.8	7.5	6.6	3.9	5.6	5.5	5.3	2.4	1.5	1.8	2.0	1.8	5.2	6.0	5.7	4.9	5.3	5.3	5.5	5.3	5.2	5.5	5.4
3.9	3.3	2.9	.9	.8	1.4	2.8	8.7	8.2	8.2	6.4	5.3	7.0	6.9	7.7	3.9	4.1	5.1	5.1	2.3	.8	1.7	1.8	1.4	1.8	4.8	8.1	8.5	5.1	4.9	4.3	5.6	7.4	7.0	5.6	3.7
7.1	6.0	5.6	6.0	6.5	6.6	7.0	10.6	11.1	9.1	6.8	5.9	5.8	6.7	6.4	5.6	9.6	9.1	8.6	6.4	7.0	7.7	4.5	1.7	3.1	8.2	9.8	9.7	9.7	7.8	9.0	10.0	9.6	9.8	8.6	7.7
8.8	7.2	7.2	8.0	6.6	4.0	4.0	5.5	6.6	8.9	10.8	10.4	6.2	6.3	7.9	7.2	8.4	6.3	9.0	11.0	11.2	8.4	2.6	2.8	6.0	7.5	10.0	10.9	11.0	11.1	9.9	11.0	10.9	10.8	11.3	10.7
6.8	3.9	1.9	1.1	1.4	1.1	1.1	1.2	1.1	2.0	9.2	10.3	8.7	4.5	1.3	.9	1.1	.7	1.9	8.1	9.7	4.6	1.8	7.1	9.7	10.2	10.9	10.9	8.6	7.2	4.6	8.9	8.5	9.0	9.8	6.5
5.7	7.4	6.4	3.7	1.9	1.4	1.3	.7	.6	.5	4.5	8.1	8.1	6.7	3.4	1.3	1.0	1.0	.8	4.5	3.2	2.0	1.7	1.8	2.1	3.0	3.8	3.0	1.9	.9	1.8	2.4	2.7	3.3	3.8	3.3
5.4	8.4	6.8	6.6	6.1	6.7	6.8	5.4	3.3	2.2	2.0	6.2	9.6	6.8	5.6	4.9	3.7	3.1	2.4	5.4	6.7	5.0	3.6	2.1	1.6	2.1	1.3	1.0	1.2	2.1	3.0	4.7	4.4	2.1	3.4	3.7
6.0	6.9	5.7	5.1	5.1	6.2	7.9	8.3	6.8	5.5	6.0	7.5	9.5	7.5	6.0	6.0	6.2	6.1	4.9	4.6	6.4	7.2	5.8	5.4	4.7	3.6	3.2	2.3	2.6	3.9	3.8	5.1	4.6	4.4	5.5	6.1
5.5	5.9	5.0	4.2	3.9	4.0	3.8	4.7	5.5	5.9	6.9	7.3	6.4	6.5	6.2	5.7	5.4	5.3	5.6	5.2	5.1	5.3	6.3	5.7	5.2	4.7	4.3	3.9	3.8	3.8	4.2	4.5	4.7	4.2	4.8	5.9
4.5	4.7	4.8	5.0	4.5	3.9	3.9	3.6	4.5	4.8	5.2	5.8	5.6	5.4	5.2	4.0	3.3	3.9	3.8	3.5	3.5	4.3	5.2	4.9	5.3	4.8	4.1	3.7	3.5	3.5	3.9	4.5	4.6	4.6	4.4	4.6
4.3	4.2	4.4	4.1	3.7	3.8	3.8	3.4	3.6	3.8	4.2	5.6	7.0	6.1	5.5	4.2	3.5	3.4	2.9	2.1	2.3	3.0	4.1	4.1	4.3	3.7	3.4	3.4	3.8	4.2	4.4	4.5	4.1	3.8	4.0	4.2
3.6	4.0	3.8	4.4	5.0	4.9	4.8	4.9	6.2	5.7	6.0	6.4	5.8	5.2	4.9	4.7	4.2	3.1	2.2	1.9	2.5	2.6	2.8	2.0	2.3	2.3	1.7	2.1	2.3	2.2	1.8	1.4	1.9	2.7	3.6	3.1
4.1	4.6	5.5	5.9	5.7	4.8	4.0	3.7	3.7	3.2	3.2	3.7	3.7	3.8	3.9	3.5	2.6	2.6	2.7	1.6	1.0	1.1	.8	1.0	1.0	1.1	1.1	1.0	1.0	1.2	1.4	1.7	2.2	3.0	3.7	3.8

Figure 60. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations



-2.8	-2.4	-2.3	-2.5	-2.5	-2.5	-2.3	-2.5	-3.0	-3.0	-2.8	-2.6	-2.5	-2.6	-2.9	-2.5	-2.5	-2.4	-2.8	-2.8	-2.8	-2.5	-2.8	-3.3	-3.3	-3.2	-3.3	-3.5	-3.2	-2.8	-3.0	-2.9	-2.6	-2.7	-2.8	-2.8
-1.9	-2.2	-2.3	-2.5	-2.4	-2.8	-2.9	-2.4	-2.3	-2.0	-2.0	-2.1	-2.6	-3.1	-2.6	-1.9	-2.1	-2.1	-2.5	-3.0	-2.9	-2.6	-2.2	-2.6	-2.8	-3.0	-3.4	-3.6	-2.9	-2.4	-2.2	-2.4	-1.9	-1.9	-1.8	-1.7
-1.1	-1.2	-2.4	-3.2	-3.4	-2.8	-2.3	-1.8	-2.1	-2.4	-3.2	-3.6	-3.7	-4.2	-3.4	-2.8	-3.0	-2.5	-3.4	-3.7	-2.7	-2.0	-2.0	-1.9	-2.6	-1.9	-1.9	-2.4	-1.7	-1.3	-1.9	-2.6	-2.5	-1.6	-2.0	-1.6
-2.5	-3.1	-3.6	-3.4	-3.4	-3.4	-2.9	-2.4	-2.8	-3.1	-3.5	-3.1	-2.1	-1.6	-2.2	-2.5	-2.3	-2.3	-2.1	-1.6	-.8	-.8	-1.3	-.7	-.7	-.8	-2.1	-3.0	-2.4	-2.2	-2.3	-2.7	-2.3	-2.2	-1.3	-1.5
-2.9	-4.1	-4.8	-2.1	-.7	-.6	-1.9	-2.3	-2.5	-2.0	-2.7	-2.1	-2.0	-1.8	-3.2	-3.2	-1.1	-1.1	-1.5	-1.6	-1.1	-.4	-1.1	.5	.8	.3	-1.5	-1.7	-1.9	-1.5	-1.3	-1.9	-2.9	-2.7	-2.5	-2.9
-1.6	-2.1	-1.1	.6	.9	.9	-.3	-1.4	-1.6	-1.1	-3.5	-3.0	-.8	-.7	-2.6	-1.8	-.2	-1.3	-1.5	-1.1	.3	.7	.9	-.1	.1	-.7	-1.4	-1.4	-.9	-.3	-1.2	-1.6	-1.5	-.8	-1.0	-1.8
-.1	.5	.9	1.4	1.4	1.0	.5	-4.2	-4.2	-3.8	-2.7	-1.6	-2.0	-2.1	-1.9	.0	-.1	-1.7	-1.8	.9	1.9	.9	.8	.5	.0	-1.2	-3.0	-5.0	-1.1	-.2	-.4	-1.3	-2.5	-2.5	-1.4	-.5
-2.3	-1.2	-.9	-.7	-1.1	-1.3	-1.8	-7.0	-8.4	-4.7	-2.1	-2.2	-1.3	-1.5	-1.3	-1.0	-6.1	-6.0	-4.2	-1.3	-1.9	-3.2	-.1	.9	.3	-2.5	-5.5	-7.7	-7.9	-3.5	-5.0	-7.8	-6.6	-5.4	-3.8	-2.7
-4.1	-1.6	-1.2	-2.3	-1.1	.1	-.2	-.7	-1.1	-4.4	-10.0	-9.7	-2.3	-.9	-2.0	-1.4	-3.2	-1.8	-4.7	-9.1	-7.9	-2.6	1.0	.8	-1.3	-3.5	-5.8	-11.4	-11.0	-10.2	-6.6	-7.6	-7.6	-6.4	-7.3	-6.3
-2.7	.0	.9	1.1	1.2	1.4	1.2	1.3	1.3	.8	-6.3	-8.7	-7.4	-1.9	.7	1.1	.9	1.2	1.0	-3.6	-6.5	-.4	1.1	-1.5	-3.7	-6.3	-8.3	-8.7	-5.0	-2.4	-4.7	-4.8	-4.9	-4.7	-5.8	-2.7
-.7	-1.5	-1.0	.6	1.1	1.3	1.3	1.7	1.6	1.6	-.2	-3.9	-6.0	-4.7	-.1	1.1	1.2	1.1	1.4	-.4	-.1	1.2	1.2	1.2	.9	.3	-.3	-.2	.6	1.4	.9	.8	-.1	-.1	.1	.1
-.7	-3.4	-2.3	-1.9	-1.6	-2.0	-1.8	-1.0	.5	.9	1.3	-.1	-4.0	-3.0	-1.3	-1.1	-.1	.4	1.0	-.2	-1.9	-.5	.6	1.0	1.0	.8	1.0	1.0	1.0	.9	.2	-.3	-.5	-.3	.3	.0
-2.6	-2.6	-2.0	-1.9	-2.0	-2.5	-4.5	-6.0	-4.2	-2.6	-2.9	-3.9	-5.7	-3.5	-2.6	-2.5	-3.0	-2.5	-1.3	-1.2	-2.7	-3.5	-2.2	-1.7	-1.0	-.5	-.2	.4	-.1	-.7	-.7	-1.2	-1.3	-1.5	-2.1	-3.3
-3.3	-3.6	-2.6	-1.9	-1.8	-1.8	-1.7	-2.2	-2.9	-3.7	-4.9	-5.5	-4.3	-4.4	-4.4	-3.8	-3.2	-3.4	-3.9	-4.1	-3.9	-3.7	-4.4	-3.7	-3.3	-3.0	-3.0	-2.9	-2.6	-2.7	-3.2	-3.2	-3.4	-2.7	-2.8	-4.3
-3.7	-3.9	-3.7	-3.6	-2.8	-2.5	-2.7	-2.5	-3.5	-3.7	-4.3	-4.7	-4.3	-4.2	-4.2	-2.8	-2.1	-2.9	-3.3	-3.8	-4.4	-5.5	-6.0	-5.5	-5.5	-4.8	-4.3	-4.2	-4.4	-4.3	-4.7	-5.2	-5.1	-4.7	-4.5	-3.8
-5.9	-5.9	-5.1	-4.6	-4.2	-4.6	-4.4	-3.7	-3.6	-4.2	-5.1	-6.8	-8.3	-7.4	-6.8	-4.9	-4.3	-3.9	-3.3	-2.8	-3.4	-5.0	-6.4	-5.9	-5.3	-5.1	-4.2	-4.4	-5.2	-5.4	-5.2	-5.4	-4.9	-5.1	-5.3	-5.7
-5.4	-6.0	-6.1	-6.6	-7.0	-6.6	-6.2	-5.9	-6.4	-6.0	-7.8	-8.1	-8.3	-7.9	-7.4	-6.2	-4.7	-3.3	-2.2	-2.3	-2.9	-2.7	-3.3	-2.7	-2.1	-1.7	-1.5	-3.1	-4.4	-4.1	-3.5	-2.4	-2.7	-3.8	-4.6	-4.8
-6.1	-6.8	-7.4	-6.6	-5.6	-5.1	-4.2	-4.4	-3.5	-2.9	-4.4	-5.6	-5.8	-5.8	-5.3	-4.4	-3.7	-3.6	-3.0	-2.4	-1.7	-1.2	-1.3	-1.8	-2.1	-2.7	-4.1	-4.4	-3.8	-3.1	-3.0	-2.7	-3.5	-3.0	-5.0	-6.3

Figure 61. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations



3.3	2.9	2.7	2.9	2.8	2.7	2.7	2.8	3.3	3.5	4.0	3.7	3.3	3.3	4.6	4.0	3.1	2.9	2.9	2.9	2.9	2.8	2.9	3.1	3.2	3.4	3.4	3.9	4.0	4.0	3.8	3.4	3.3	3.5	3.6	3.6
3.0	3.1	3.2	3.5	3.5	3.6	3.6	3.7	3.6	3.4	3.6	3.7	3.5	2.9	3.0	4.0	3.6	3.4	3.9	4.5	4.1	3.9	3.7	3.8	4.0	4.2	4.1	4.5	4.2	4.4	4.1	3.9	3.3	3.3	3.1	3.1
3.1	3.3	4.9	5.4	4.7	4.6	4.1	4.0	4.1	4.1	5.3	5.2	5.3	5.8	5.5	5.2	5.7	5.0	5.4	5.6	5.3	4.4	4.5	4.4	5.1	4.3	4.3	4.4	3.7	3.7	4.5	5.3	4.5	3.6	4.3	3.9
5.2	5.6	6.1	5.9	5.8	6.1	5.7	5.0	5.7	5.9	6.4	5.4	5.1	4.7	5.3	5.8	5.4	4.6	4.8	4.4	3.9	4.4	5.3	4.8	4.5	4.6	5.2	5.6	5.4	5.2	5.5	5.6	4.8	4.7	3.9	4.3
6.9	7.4	7.5	5.5	4.4	4.3	5.5	6.2	6.9	5.8	6.3	6.3	6.2	5.8	7.7	7.2	5.1	5.1	6.0	5.6	4.3	4.0	4.6	3.8	3.3	4.2	5.8	6.2	5.9	6.1	5.9	6.3	6.2	6.1	6.3	7.2
6.2	7.2	6.1	2.8	1.7	2.3	5.1	6.3	6.5	6.0	8.4	7.7	5.4	5.1	7.8	6.7	4.4	5.2	5.5	5.8	2.7	2.0	2.3	2.4	2.4	5.3	5.7	5.4	4.7	5.7	5.3	5.4	5.4	5.5	5.8	5.8
4.4	3.9	3.0	1.1	1.0	1.7	3.1	9.7	9.1	9.0	7.1	6.0	7.6	7.4	7.8	4.1	3.9	4.2	3.9	2.5	1.9	2.2	2.4	2.1	2.6	6.0	9.9	10.0	5.6	5.6	5.0	6.3	7.8	7.7	6.1	4.2
8.2	7.2	7.0	7.3	7.4	7.7	7.7	11.7	12.3	10.6	7.9	6.9	7.0	7.6	7.2	6.4	11.0	10.2	9.6	7.2	7.6	8.5	4.6	1.8	3.7	7.4	11.6	10.4	11.0	9.0	10.3	11.6	11.3	11.4	9.6	8.5
10.2	8.6	8.2	9.1	7.5	4.2	4.5	6.1	7.4	10.4	12.3	12.0	7.3	6.8	8.5	7.5	9.0	7.1	9.9	12.6	12.9	9.9	2.8	3.4	6.6	8.2	10.3	11.5	12.4	12.2	10.8	11.8	11.8	12.2	12.4	11.7
8.1	4.9	2.6	1.9	2.1	1.8	1.7	1.8	2.0	3.1	10.6	12.0	10.7	5.9	1.7	1.1	1.5	1.2	2.2	9.2	11.6	5.3	2.2	7.8	10.4	11.4	12.0	12.0	9.9	7.9	4.8	8.3	9.5	10.4	11.1	8.2
6.0	7.3	6.8	4.1	2.1	1.6	1.6	1.0	1.1	1.3	4.7	9.1	8.5	6.7	4.1	1.8	1.4	1.7	1.4	4.7	3.9	2.3	1.6	2.1	2.2	3.8	5.0	4.2	2.7	1.4	1.9	3.1	3.4	3.9	3.4	3.7
5.5	8.1	6.6	7.0	6.2	6.5	6.9	5.9	3.9	3.1	3.0	7.9	10.0	7.2	6.0	5.0	4.1	3.8	3.5	6.0	6.5	5.5	3.4	2.1	2.0	2.3	1.4	1.3	1.4	1.8	2.4	3.8	3.9	2.2	3.0	3.7
6.9	7.7	6.3	5.8	6.0	6.9	8.7	9.0	7.5	6.5	7.1	9.3	12.1	8.2	6.7	6.7	7.0	6.6	5.7	5.5	7.3	8.4	6.6	5.9	5.0	4.0	3.6	2.9	3.0	3.9	4.2	5.4	4.6	4.9	6.1	7.1
6.8	6.9	5.8	5.0	4.7	5.0	4.7	5.7	6.5	7.0	7.6	9.1	8.2	8.0	7.6	6.9	6.4	6.4	6.8	6.4	6.4	6.4	7.4	6.7	6.2	5.9	5.5	4.9	5.0	5.0	5.5	5.8	6.0	5.5	6.1	7.6
6.1	6.3	6.0	6.1	5.6	5.1	5.2	4.8	5.9	6.2	6.8	8.1	7.5	7.2	7.1	5.5	4.7	5.7	5.5	5.0	5.2	5.7	6.8	6.6	6.8	6.5	5.7	5.1	5.0	5.2	5.4	6.5	6.4	6.3	6.1	6.1
5.8	5.7	6.0	5.8	5.3	5.4	5.5	5.0	5.2	5.4	5.8	8.1	10.4	9.4	8.3	6.7	5.7	5.4	4.5	3.4	3.7	4.8	6.3	6.3	6.1	5.5	5.4	5.6	6.0	6.1	6.5	6.4	5.8	5.6	5.7	5.8
5.0	5.5	5.4	6.5	7.4	7.3	7.1	6.8	8.8	8.1	8.6	9.7	8.7	8.0	7.6	7.1	6.7	5.6	4.6	3.9	4.7	4.9	5.1	4.1	4.5	4.4	3.3	4.1	4.5	4.2	3.4	2.8	3.4	4.6	6.4	4.8
6.8	7.4	8.7	9.3	9.2	7.9	6.8	6.2	6.5	5.5	5.5	6.1	6.2	6.3	6.2	5.9	4.9	5.1	5.4	3.4	2.7	2.3	2.0	2.5	2.5	2.5	2.5	2.5	2.7	2.5	2.7	2.9	3.1	3.3	3.9	5.7	6.9	6.6

Figure 62. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: HIRS4 (400 hPa)
NOAA17, using all observations

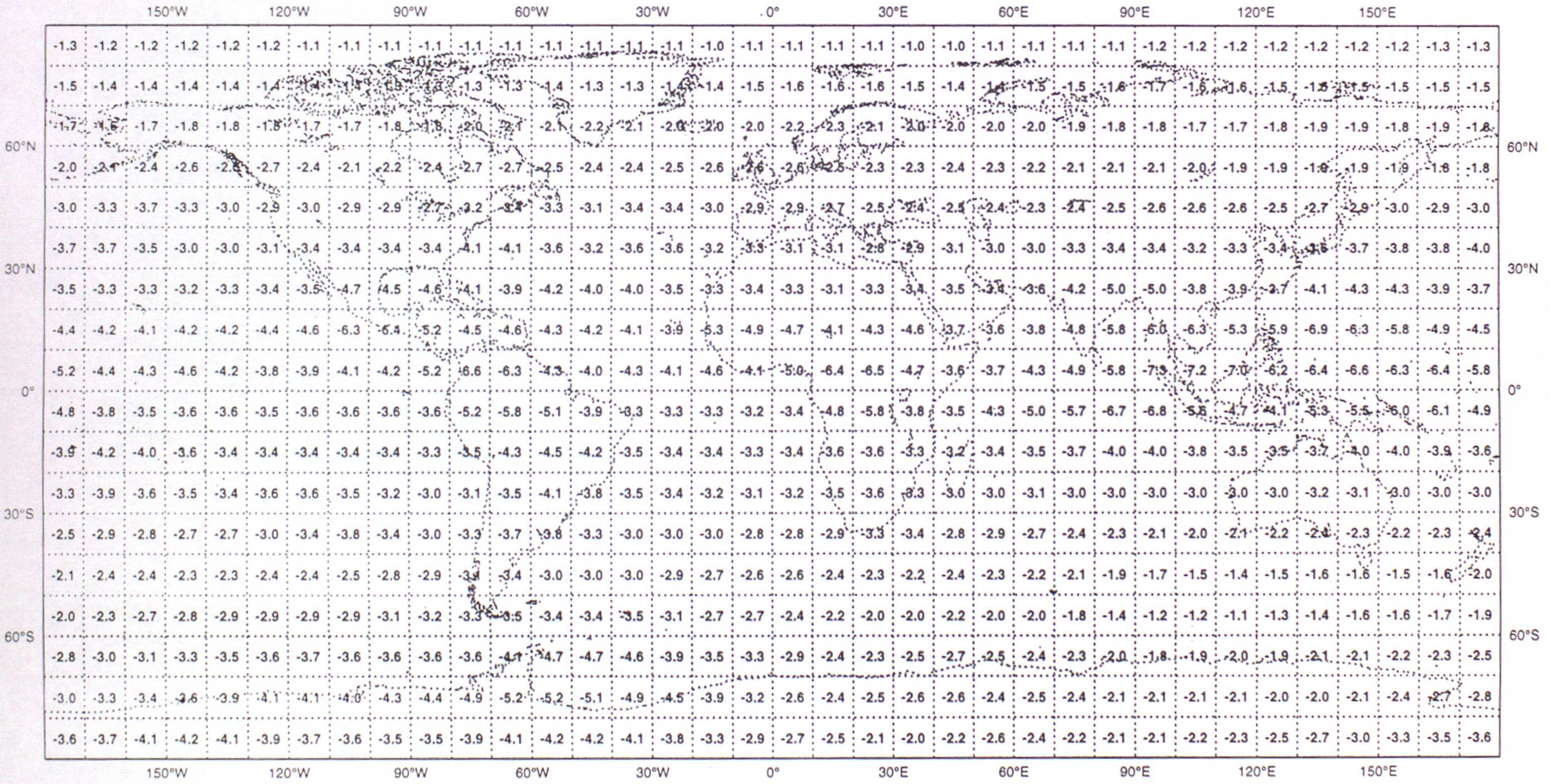
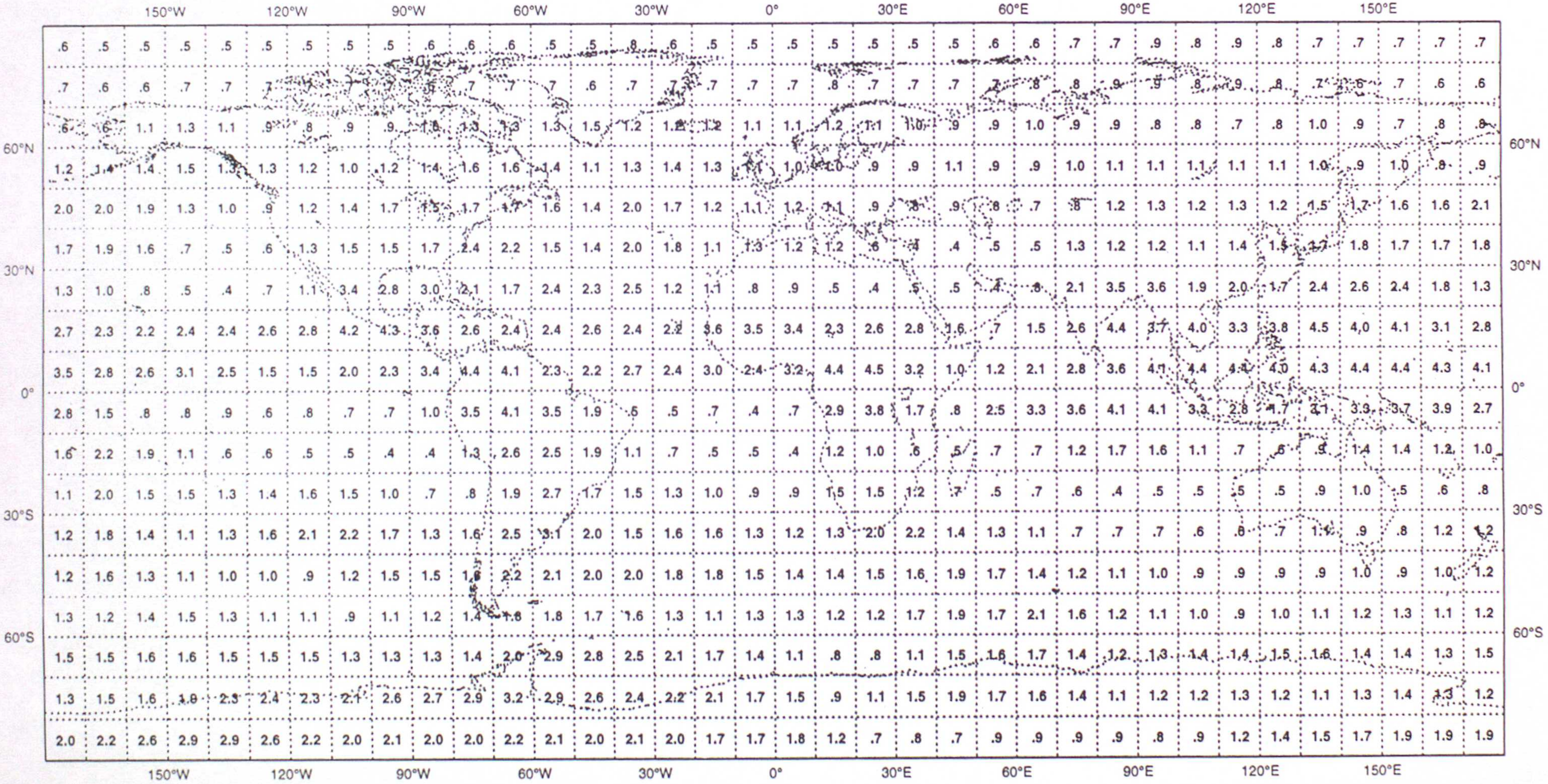

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.3 -1.2 -1.2 -1.2 -1.2 -1.2 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.1 -1.0 -1.1 -1.1 -1.1 -1.1 -1.0 -1.0 -1.1 -1.1 -1.1 -1.1 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.3 -1.3
-1.5 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.5 -1.3 -1.3 -1.3 -1.3 -1.4 -1.3 -1.3 -1.4 -1.4 -1.5 -1.6 -1.6 -1.6 -1.5 -1.4 -1.4 -1.5 -1.5 -1.6 -1.7 -1.6 -1.6 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5
-1.7 -1.6 -1.7 -1.8 -1.8 -1.8 -1.7 -1.7 -1.8 -1.8 -2.0 -2.1 -2.1 -2.2 -2.1 -2.0 -2.0 -2.0 -2.2 -2.3 -2.1 -2.0 -2.0 -2.0 -2.0 -1.9 -1.8 -1.8 -1.7 -1.7 -1.8 -1.9 -1.9 -1.8 -1.9 -1.8
-2.0 -2.1 -2.4 -2.6 -2.8 -2.7 -2.4 -2.1 -2.2 -2.4 -2.7 -2.7 -2.5 -2.4 -2.4 -2.5 -2.6 -2.6 -2.6 -2.5 -2.3 -2.3 -2.4 -2.3 -2.2 -2.1 -2.1 -2.1 -2.0 -1.9 -1.9 -1.8 -1.9 -1.9 -1.8 -1.8
-3.0 -3.3 -3.7 -3.3 -3.0 -2.9 -3.0 -2.9 -2.9 -2.7 -3.2 -3.4 -3.3 -3.1 -3.4 -3.4 -3.0 -2.9 -2.9 -2.7 -2.5 -2.4 -2.5 -2.4 -2.3 -2.4 -2.5 -2.6 -2.6 -2.6 -2.5 -2.7 -2.9 -3.0 -2.9 -3.0
-3.7 -3.7 -3.5 -3.0 -3.0 -3.1 -3.4 -3.4 -3.4 -3.4 -4.1 -4.1 -3.6 -3.2 -3.6 -3.6 -3.2 -3.3 -3.1 -3.1 -2.8 -2.9 -3.1 -3.0 -3.0 -3.3 -3.4 -3.4 -3.2 -3.3 -3.4 -3.6 -3.7 -3.8 -3.8 -4.0
-3.5 -3.3 -3.3 -3.2 -3.3 -3.4 -3.5 -4.7 -4.5 -4.6 -4.1 -3.9 -4.2 -4.0 -4.0 -3.5 -3.3 -3.4 -3.3 -3.1 -3.3 -3.4 -3.5 -3.4 -3.6 -4.2 -5.0 -5.0 -3.8 -3.9 -3.7 -4.1 -4.3 -4.3 -3.9 -3.7
-4.4 -4.2 -4.1 -4.2 -4.2 -4.4 -4.6 -6.3 -6.4 -5.2 -4.5 -4.6 -4.3 -4.2 -4.1 -3.9 -5.3 -4.9 -4.7 -4.1 -4.3 -4.6 -3.7 -3.6 -3.8 -4.8 -5.8 -6.0 -6.3 -5.3 -5.9 -6.9 -6.3 -5.8 -4.9 -4.5
-5.2 -4.4 -4.3 -4.6 -4.2 -3.8 -3.9 -4.1 -4.2 -5.2 -6.6 -6.3 -4.3 -4.0 -4.3 -4.1 -4.6 -4.1 -5.0 -6.4 -6.5 -4.7 -3.6 -3.7 -4.3 -4.9 -5.8 -7.3 -7.2 -7.0 -6.2 -6.4 -6.6 -6.3 -6.4 -5.8
-4.8 -3.8 -3.5 -3.6 -3.6 -3.5 -3.6 -3.6 -3.6 -3.6 -5.2 -5.8 -5.1 -3.9 -3.3 -3.3 -3.3 -3.2 -3.4 -4.8 -5.8 -3.8 -3.5 -4.3 -5.0 -5.7 -6.7 -6.8 -5.6 -4.7 -4.1 -5.3 -5.5 -6.0 -6.1 -4.9
-3.9 -4.2 -4.0 -3.6 -3.4 -3.4 -3.4 -3.4 -3.4 -3.3 -3.5 -4.3 -4.5 -4.2 -3.5 -3.4 -3.4 -3.3 -3.4 -3.6 -3.6 -3.3 -3.2 -3.4 -3.5 -3.7 -4.0 -4.0 -3.8 -3.5 -3.5 -3.7 -4.0 -4.0 -3.9 -3.6
-3.3 -3.9 -3.6 -3.5 -3.4 -3.6 -3.6 -3.5 -3.2 -3.0 -3.1 -3.5 -4.1 -3.8 -3.5 -3.4 -3.2 -3.1 -3.2 -3.5 -3.6 -3.3 -3.0 -3.0 -3.1 -3.0 -3.0 -3.0 -3.0 -3.0 -3.0 -3.2 -3.1 -3.0 -3.0 -3.0
-2.5 -2.9 -2.8 -2.7 -2.7 -3.0 -3.4 -3.8 -3.4 -3.0 -3.3 -3.7 -3.8 -3.3 -3.0 -3.0 -3.0 -2.8 -2.8 -2.9 -3.3 -3.4 -2.8 -2.9 -2.7 -2.4 -2.3 -2.1 -2.0 -2.1 -2.2 -2.4 -2.3 -2.2 -2.3 -2.4
-2.1 -2.4 -2.4 -2.3 -2.3 -2.4 -2.4 -2.5 -2.8 -2.9 -3.4 -3.4 -3.0 -3.0 -3.0 -2.9 -2.7 -2.6 -2.6 -2.4 -2.3 -2.2 -2.4 -2.3 -2.2 -2.1 -1.9 -1.7 -1.5 -1.4 -1.5 -1.6 -1.6 -1.5 -1.6 -2.0
-2.0 -2.3 -2.7 -2.8 -2.9 -2.9 -2.9 -2.9 -3.1 -3.2 -3.3 -3.5 -3.4 -3.4 -3.5 -3.1 -2.7 -2.7 -2.4 -2.2 -2.0 -2.0 -2.2 -2.0 -2.0 -1.8 -1.4 -1.2 -1.2 -1.1 -1.3 -1.4 -1.6 -1.6 -1.7 -1.9
-2.8 -3.0 -3.1 -3.3 -3.5 -3.6 -3.7 -3.6 -3.6 -3.6 -3.6 -4.1 -4.7 -4.7 -4.6 -3.9 -3.5 -3.3 -2.9 -2.4 -2.3 -2.5 -2.7 -2.5 -2.4 -2.3 -2.0 -1.8 -1.9 -2.0 -1.9 -2.1 -2.1 -2.2 -2.3 -2.5
-3.0 -3.3 -3.4 -3.6 -3.9 -4.1 -4.1 -4.0 -4.3 -4.4 -4.9 -5.2 -5.2 -5.1 -4.9 -4.5 -3.9 -3.2 -2.6 -2.4 -2.5 -2.6 -2.6 -2.4 -2.5 -2.4 -2.1 -2.1 -2.1 -2.1 -2.0 -2.0 -2.1 -2.4 -2.7 -2.8
-3.6 -3.7 -4.1 -4.2 -4.1 -3.9 -3.7 -3.6 -3.5 -3.5 -3.9 -4.1 -4.2 -4.2 -4.1 -3.8 -3.3 -2.9 -2.7 -2.5 -2.1 -2.0 -2.2 -2.6 -2.4 -2.2 -2.1 -2.1 -2.2 -2.3 -2.5 -2.7 -3.0 -3.3 -3.5 -3.6

Figure 63. ATOVS SD O-B brightness temperature differences (deg C). **SEPTEMBER 2003**
Channel: HIRS4 (400 hPa)
NOAA17, using all observations



.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.8	.6	.5	.5	.5	.5	.5	.5	.5	.6	.6	.7	.7	.9	.8	.9	.8	.7	.7	.7	.7	.7
.7	.6	.6	.7	.7	.7	.7	.7	.7	.5	.7	.7	.7	.6	.7	.7	.7	.7	.7	.8	.7	.7	.7	.7	.8	.8	.9	.9	.8	.9	.8	.7	.6	.7	.6	.6
.6	.6	1.1	1.3	1.1	.9	.8	.9	.9	1.6	1.3	1.3	1.3	1.5	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.0	.9	.9	1.0	.9	.9	.8	.8	.7	.8	1.0	.9	.7	.8	.8
1.2	1.4	1.4	1.5	1.3	1.3	1.2	1.0	1.2	1.4	1.6	1.6	1.4	1.1	1.3	1.4	1.3	1.1	1.0	1.0	.9	.9	1.1	.9	.9	1.0	1.1	1.1	1.1	1.1	1.1	1.0	.9	1.0	.8	.9
2.0	2.0	1.9	1.3	1.0	.9	1.2	1.4	1.7	1.5	1.7	1.7	1.6	1.4	2.0	1.7	1.2	1.1	1.2	1.1	.9	.8	.9	.8	.7	.8	1.2	1.3	1.2	1.3	1.2	1.5	1.7	1.6	1.6	2.1
1.7	1.9	1.6	.7	.5	.6	1.3	1.5	1.5	1.7	2.4	2.2	1.5	1.4	2.0	1.8	1.1	1.3	1.2	1.2	.6	.4	.4	.5	.5	1.3	1.2	1.2	1.1	1.4	1.5	1.7	1.8	1.7	1.7	1.8
1.3	1.0	.8	.5	.4	.7	1.1	3.4	2.8	3.0	2.1	1.7	2.4	2.3	2.5	1.2	1.1	.8	.9	.5	.4	.5	.5	.4	.8	2.1	3.5	3.6	1.9	2.0	1.7	2.4	2.6	2.4	1.8	1.3
2.7	2.3	2.2	2.4	2.4	2.6	2.8	4.2	4.3	3.6	2.6	2.4	2.4	2.6	2.4	2.2	3.6	3.5	3.4	2.3	2.6	2.8	1.6	.7	1.5	2.6	4.4	3.7	4.0	3.3	3.8	4.5	4.0	4.1	3.1	2.8
3.5	2.8	2.6	3.1	2.5	1.5	1.5	2.0	2.3	3.4	4.4	4.1	2.3	2.2	2.7	2.4	3.0	2.4	3.2	4.4	4.5	3.2	1.0	1.2	2.1	2.8	3.6	4.1	4.4	4.4	4.0	4.3	4.4	4.4	4.3	4.1
2.8	1.5	.8	.8	.9	.6	.8	.7	.7	1.0	3.5	4.1	3.5	1.9	.5	.5	.7	.4	.7	2.9	3.8	1.7	.8	2.5	3.3	3.6	4.1	4.1	3.3	2.8	1.7	3.1	3.3	3.7	3.9	2.7
1.6	2.2	1.9	1.1	.6	.6	.5	.5	.4	.4	1.3	2.6	2.5	1.9	1.1	.7	.5	.5	.4	1.2	1.0	.6	.5	.7	.7	1.2	1.7	1.6	1.1	.7	.6	.9	1.4	1.4	1.2	1.0
1.1	2.0	1.5	1.5	1.3	1.4	1.6	1.5	1.0	.7	.8	1.9	2.7	1.7	1.5	1.3	1.0	.9	.9	1.5	1.5	1.2	.7	.5	.7	.6	.4	.5	.5	.5	.5	.9	1.0	.5	.6	.8
1.2	1.8	1.4	1.1	1.3	1.6	2.1	2.2	1.7	1.3	1.6	2.5	3.1	2.0	1.5	1.6	1.6	1.3	1.2	1.3	2.0	2.2	1.4	1.3	1.1	.7	.7	.7	.6	.6	.7	1.1	.9	.8	1.2	1.2
1.2	1.6	1.3	1.1	1.0	1.0	.9	1.2	1.5	1.5	1.6	2.2	2.1	2.0	2.0	1.8	1.8	1.5	1.4	1.4	1.5	1.6	1.9	1.7	1.4	1.2	1.1	1.0	.9	.9	.9	.9	1.0	.9	1.0	1.2
1.3	1.2	1.4	1.5	1.3	1.1	1.1	.9	1.1	1.2	1.4	1.6	1.8	1.7	1.6	1.3	1.1	1.3	1.3	1.2	1.2	1.7	1.9	1.7	2.1	1.6	1.2	1.1	1.0	.9	1.0	1.1	1.2	1.3	1.1	1.2
1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.3	1.3	1.3	1.4	2.0	2.9	2.8	2.5	2.1	1.7	1.4	1.1	.8	.8	1.1	1.5	1.6	1.7	1.4	1.2	1.3	1.4	1.4	1.5	1.6	1.4	1.4	1.3	1.5
1.3	1.5	1.6	1.8	2.3	2.4	2.3	2.1	2.6	2.7	2.9	3.2	2.9	2.6	2.4	2.2	2.1	1.7	1.5	.9	1.1	1.5	1.9	1.7	1.6	1.4	1.1	1.2	1.2	1.3	1.2	1.1	1.3	1.4	1.3	1.2
2.0	2.2	2.6	2.9	2.9	2.6	2.2	2.0	2.1	2.0	2.0	2.2	2.1	2.0	2.1	2.0	1.7	1.7	1.8	1.2	.7	.8	.7	.9	.9	.9	.9	.8	.9	1.2	1.4	1.5	1.7	1.9	1.9	1.9

Figure 64. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations

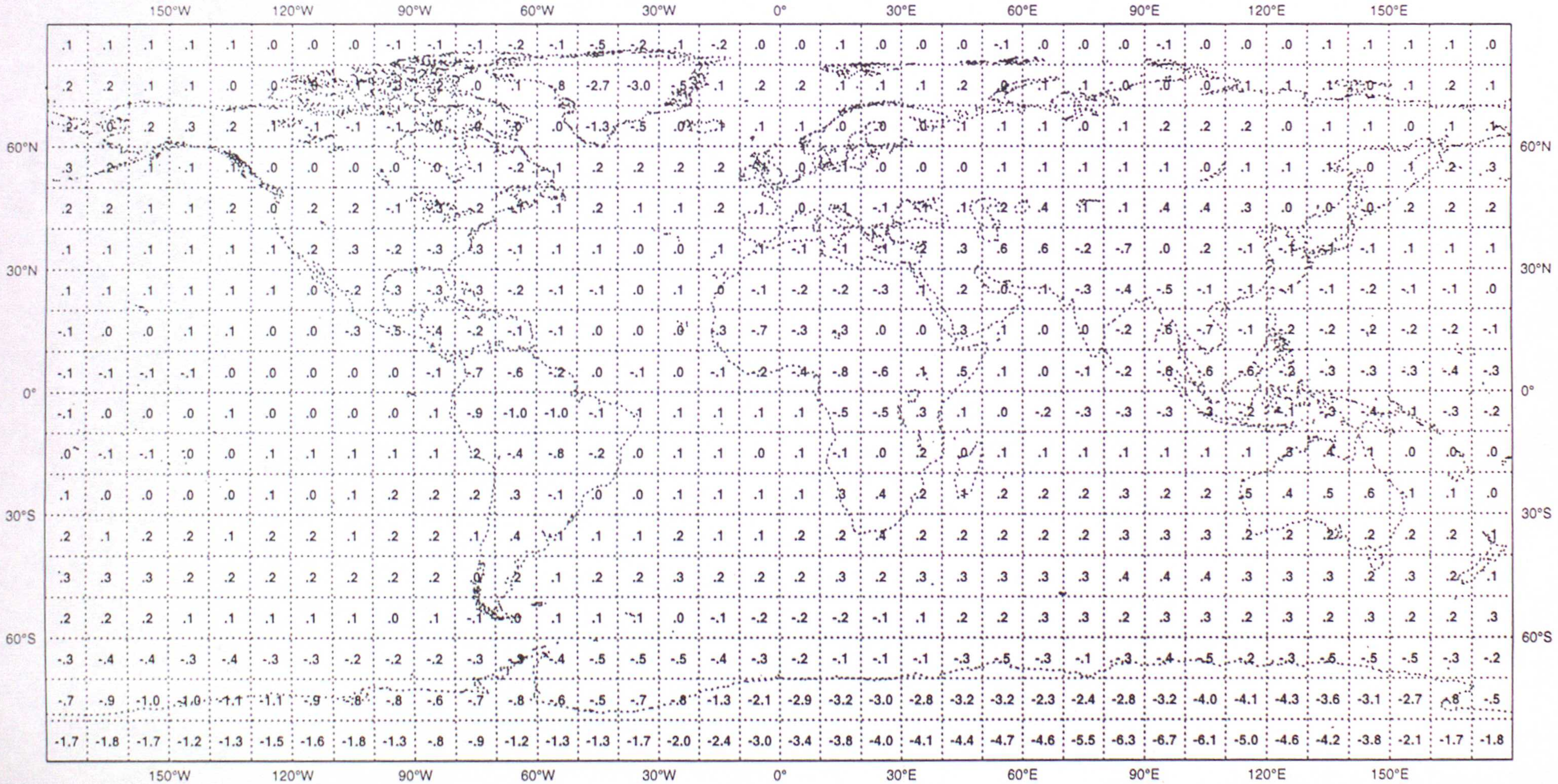

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.1 .1 .1 .1 .1 .0 .0 .0 -.1 -.1 -.1 -.2 -.1 -.5 -.2 .1 -.2 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .0 -.1 .0 .0 .0 .1 .1 .1 .1 .0
.2 .2 .1 .1 .0 .0 .3 .1 .3 .2 .0 .1 .8 -2.7 -3.0 -.5 .1 .2 .2 .1 .1 .1 .2 .0 .1 .1 .0 .0 .0 .1 .1 .1 .0 .1 .2 .1
.2 .0 .2 .3 .2 .1 -.1 -.1 -.1 .0 .0 .0 .0 -1.3 -.5 .0 .1 .1 .1 .0 .0 .0 .1 .1 .1 .0 .1 .2 .2 .2 .0 .1 .1 .0 .1 .1
.3 .2 .1 .1 .1 .0 .0 .0 .0 .0 -.1 -.2 .1 .2 .2 .2 .2 .1 .0 .1 .0 .0 .0 .1 .1 .1 .1 .1 .0 .1 .1 .1 .0 .1 .2 .3
.2 .2 .1 .1 .2 .0 .2 .2 -.1 -.3 -.2 -.1 .1 .2 .1 .1 .2 .1 .0 .1 -.1 .1 .1 .2 .4 .1 .1 .4 .4 .3 .0 .0 .0 .2 .2 .2
.1 .1 .1 .1 .1 .1 .2 .3 -.2 -.3 .3 -.1 .1 .1 .0 .0 .1 .1 -.1 -.1 -.1 .2 .3 .6 .6 -.2 -.7 .0 .2 -.1 -.1 -.1 -.1 .1 .1 .1
.1 .1 .1 .1 .1 .1 .0 -.2 -.3 -.3 -.3 -.2 -.1 -.1 .0 .1 .0 -.1 -.2 -.2 -.3 .1 .2 .0 .1 -.3 -.4 -.5 -.1 -.1 -.1 -.1 -.2 -.1 -.1 .0
-.1 .0 .0 .1 .1 .0 .0 -.3 -.5 -.4 -.2 -.1 -.1 .0 .0 .0 .3 -.7 -.3 -.3 .0 .0 .3 .1 .0 .0 -.2 -.6 -.7 -.1 -.2 -.2 -.2 -.2 -.2 -.1
-.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 -.1 -.7 -.6 -.2 .0 -.1 .0 -.1 -.2 -.4 -.8 -.6 .1 .5 .1 .0 -.1 -.2 -.8 -.6 -.6 -.2 -.3 -.3 -.3 -.4 -.3
-.1 .0 .0 .0 .1 .0 .0 .0 .0 .1 -.9 -1.0 -1.0 -.1 .1 .1 .1 .1 .1 -.5 -.5 .3 .1 .0 -.2 -.3 -.3 -.3 -.3 -.2 .1 -.3 -.4 .1 -.3 -.2
.0 -.1 -.1 .0 .0 .1 .1 .1 .1 .1 .2 -.4 -.8 -.2 .0 .1 .1 .0 .1 -.1 .0 .2 .0 .1 .1 .1 .1 .1 .1 .1 .3 .4 .1 .0 .0 .0
.1 .0 .0 .0 .0 .1 .0 .1 .2 .2 .2 .3 -.1 .0 .0 .1 .1 .1 .1 .3 .4 .2 .1 .2 .2 .2 .3 .2 .2 .5 .4 .5 .6 .1 .1 .0
.2 .1 .2 .2 .1 .2 .2 .1 .2 .2 .1 .4 -.1 .1 .1 .2 .1 .1 .2 .2 .4 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2 .2 .1
.3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .0 .2 .1 .2 .2 .3 .2 .2 .2 .3 .2 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .2 .3 .2 .1
.2 .2 .2 .1 .1 .1 .1 .1 .0 .1 -.1 .0 .1 .1 .1 .0 -.1 -.2 -.2 -.2 -.1 .1 .2 .2 .3 .3 .2 .3 .3 .2 .3 .2 .3 .2 .2 .3
-.3 -.4 -.4 -.3 -.4 -.3 -.3 -.2 -.2 -.2 -.3 -.3 -.4 -.5 -.5 -.5 -.4 -.3 -.2 -.1 -.1 -.1 -.3 -.5 -.3 -.1 -.3 -.4 -.5 -.2 -.3 -.5 -.5 -.5 -.3 -.2
-.7 -.9 -1.0 -1.0 -1.1 -1.1 -.9 -.8 -.8 -.6 -.7 -.8 -.6 -.5 -.7 -.8 -1.3 -2.1 -2.9 -3.2 -3.0 -2.8 -3.2 -3.2 -2.3 -2.4 -2.8 -3.2 -4.0 -4.1 -4.3 -3.6 -3.1 -2.7 -.8 -.5
-1.7 -1.8 -1.7 -1.2 -1.3 -1.5 -1.6 -1.8 -1.3 -.8 -.9 -1.2 -1.3 -1.3 -1.7 -2.0 -2.4 -3.0 -3.4 -3.8 -4.0 -4.1 -4.4 -4.7 -4.6 -5.5 -6.3 -6.7 -6.1 -5.0 -4.6 -4.2 -3.8 -2.1 -1.7 -1.8

Figure 65. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations

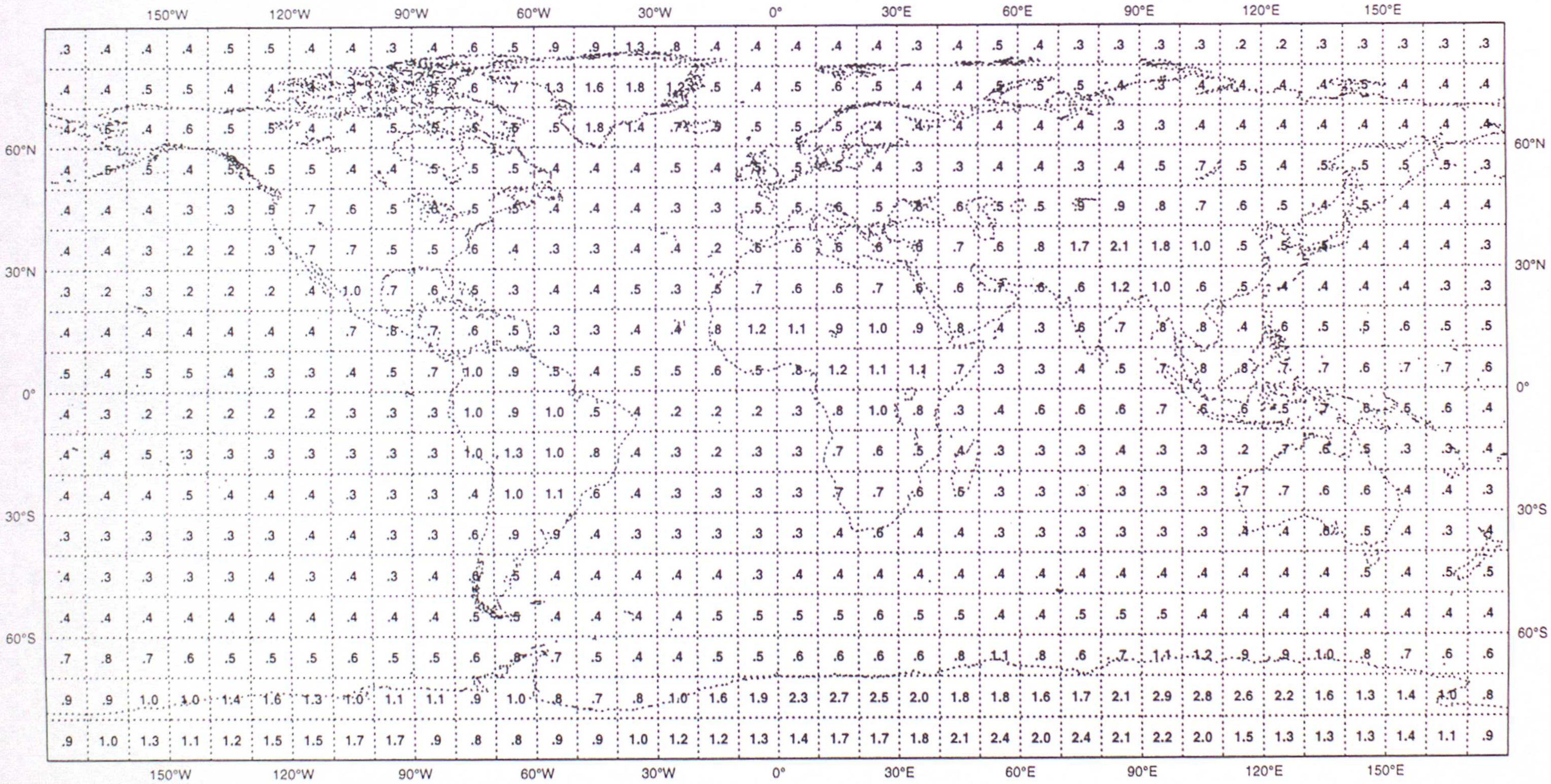
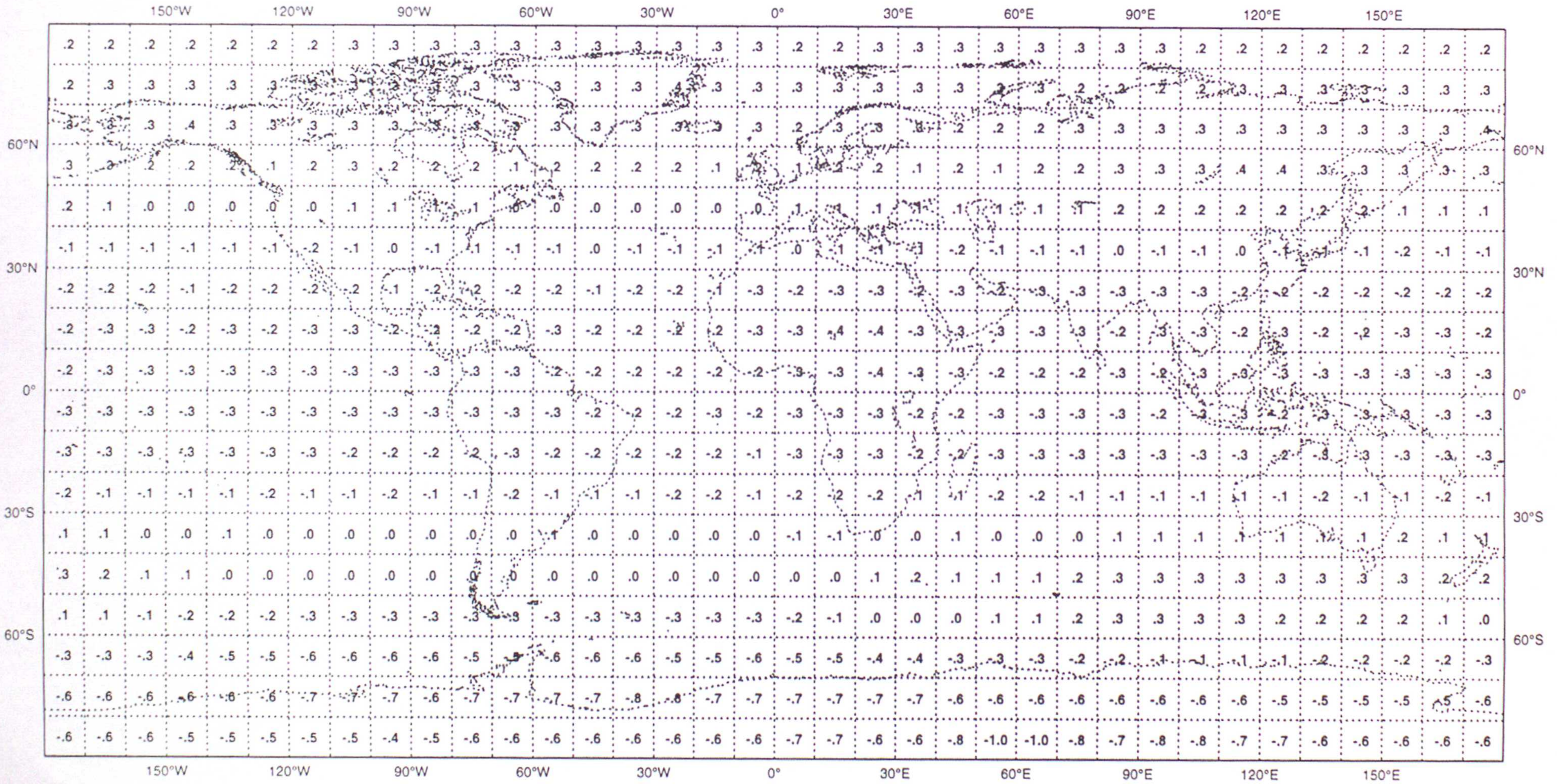

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .4 .4 .4 .5 .5 .4 .4 .3 .4 .6 .5 .9 .9 1.3 .8 .4 .4 .4 .4 .4 .3 .4 .5 .4 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3
.4 .4 .5 .5 .4 .4 .4 .3 .3 .5 .6 .7 1.3 1.6 1.8 1.2 .5 .4 .5 .6 .5 .4 .4 .5 .5 .5 .4 .3 .4 .4 .4 .4 .5 .4 .4 .4
.4 .5 .4 .6 .5 .5 .4 .4 .5 .5 .5 .5 .5 1.8 1.4 .7 .9 .5 .5 .5 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4
.4 .5 .5 .4 .5 .5 .5 .4 .4 .5 .5 .5 .4 .4 .4 .5 .4 .5 .5 .5 .4 .3 .3 .4 .4 .3 .4 .5 .7 .5 .4 .5 .5 .5 .5 .3
.4 .4 .4 .3 .3 .5 .7 .6 .5 .6 .5 .5 .4 .4 .4 .3 .3 .5 .5 .6 .5 .8 .6 .5 .5 .9 .9 .8 .7 .6 .5 .4 .5 .4 .4 .4
.4 .4 .3 .2 .2 .3 .7 .7 .5 .5 .6 .4 .3 .3 .4 .4 .2 .6 .6 .6 .6 .6 .7 .6 .8 1.7 2.1 1.8 1.0 .5 .5 .5 .4 .4 .4 .3
.3 .2 .3 .2 .2 .2 .4 1.0 .7 .6 .5 .3 .4 .4 .5 .3 .5 .7 .6 .6 .7 .6 .6 .7 .6 .6 1.2 1.0 .6 .5 .4 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .4 .4 .7 .8 .7 .6 .5 .3 .3 .4 .4 .8 1.2 1.1 .9 1.0 .9 .8 .4 .3 .6 .7 .8 .8 .4 .6 .5 .5 .6 .5 .5
.5 .4 .5 .5 .4 .3 .3 .4 .5 .7 1.0 .9 .5 .4 .5 .5 .6 .5 .8 1.2 1.1 1.1 .7 .3 .3 .4 .5 .7 .8 .8 .7 .7 .6 .7 .7 .6
.4 .3 .2 .2 .2 .2 .2 .3 .3 .3 1.0 .9 1.0 .5 .4 .2 .2 .2 .3 .8 1.0 .8 .3 .4 .6 .6 .6 .7 .6 .6 .5 .7 .8 .5 .6 .4
.4 .4 .5 .3 .3 .3 .3 .3 .3 .3 1.0 1.3 1.0 .8 .4 .3 .2 .3 .3 .7 .6 .5 .4 .3 .3 .3 .4 .3 .3 .2 .7 .6 .5 .3 .3 .4
.4 .4 .4 .5 .4 .4 .4 .3 .3 .3 .4 1.0 1.1 .6 .4 .3 .3 .3 .3 .7 .7 .6 .5 .3 .3 .3 .3 .3 .3 .7 .7 .6 .6 .4 .4 .3
.3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .6 .9 .9 .4 .3 .3 .3 .3 .3 .4 .6 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .8 .5 .4 .3 .4
.4 .3 .3 .3 .3 .4 .3 .4 .3 .4 .6 .5 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .6 .5 .5 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4
.7 .8 .7 .6 .5 .5 .5 .6 .5 .5 .6 .8 .7 .5 .4 .4 .5 .5 .6 .6 .6 .6 .8 1.1 .8 .6 .7 1.1 1.2 .9 .9 1.0 .8 .7 .6 .6
.9 .9 1.0 1.0 1.4 1.6 1.3 1.0 1.1 1.1 .9 1.0 .8 .7 .8 1.0 1.6 1.9 2.3 2.7 2.5 2.0 1.8 1.8 1.6 1.7 2.1 2.9 2.8 2.6 2.2 1.6 1.3 1.4 1.0 .8
.9 1.0 1.3 1.1 1.2 1.5 1.5 1.7 1.7 .9 .8 .8 .9 .9 1.0 1.2 1.2 1.3 1.4 1.7 1.7 1.8 2.1 2.4 2.0 2.4 2.1 2.2 2.0 1.5 1.3 1.3 1.3 1.4 1.1 .9

Figure 66. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations



.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2
.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.2	.3	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4
.3	.3	.2	.2	.2	.1	.2	.3	.2	.2	.2	.1	.2	.2	.2	.2	.1	.2	.1	.2	.2	.1	.2	.1	.2	.2	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3
.2	.1	.0	.0	.0	.0	.0	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1
-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.1	.0	-.1	.1	-.1	-.1	.0	-.1	-.1	-.1	-.1	.0	-.1	-.1	-.1	-.2	-.1	-.1	-.1	.0	-.1	-.1	.0	-.1	-.1	-.1	-.2	-.1	-.1
-.2	-.2	-.2	-.1	-.2	-.2	-.2	-.2	-.1	-.2	-.2	-.2	-.2	-.1	-.2	-.2	-.1	-.3	-.2	-.3	-.3	-.2	-.3	-.2	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.2	-.2	-.2
-.2	-.3	-.3	-.2	-.3	-.2	-.3	-.3	-.2	-.2	-.2	-.2	-.3	-.2	-.2	-.2	-.2	-.3	-.3	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.2	-.3	-.3	-.2	-.3	-.2	-.2	-.3	-.3	-.2
-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.2	-.2	-.3	-.3	-.4	-.3	-.3	-.2	-.2	-.2	-.3	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3
-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.3	-.2	-.3	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.3	-.2	-.3	-.3	-.2	-.3	-.3	-.3	-.3	-.3
-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.3	-.2	-.2	-.2	-.2	-.2	-.1	-.3	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.3	-.3	-.3	-.3	-.3
-.2	-.1	-.1	-.1	-.1	-.2	-.1	-.1	-.2	-.1	-.1	-.2	-.1	-.1	-.1	-.2	-.2	-.1	-.2	-.2	-.2	-.1	-.1	-.2	-.2	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.1	-.1	-.2	-.1
.1	.1	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	-.1	-.1	.0	.0	.1	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1
.3	.2	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.1	.1	.1	.2	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2
.1	.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.1	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.2	.2	.2	.2	.1	.0
-.3	-.3	-.3	-.4	-.5	-.5	-.6	-.6	-.6	-.6	-.5	-.5	-.6	-.6	-.6	-.5	-.5	-.6	-.5	-.5	-.4	-.4	-.3	-.3	-.3	-.2	-.2	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.3
-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.7	-.6	-.7	-.7	-.7	-.7	-.8	-.8	-.7	-.7	-.7	-.7	-.7	-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.5	-.5	-.5	-.5	-.5	-.6
-.6	-.6	-.6	-.5	-.5	-.5	-.5	-.5	-.4	-.5	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.6	-.6	-.8	-1.0	-1.0	-.8	-.7	-.8	-.8	-.7	-.7	-.6	-.6	-.6	-.6	-.6

Figure 67. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations

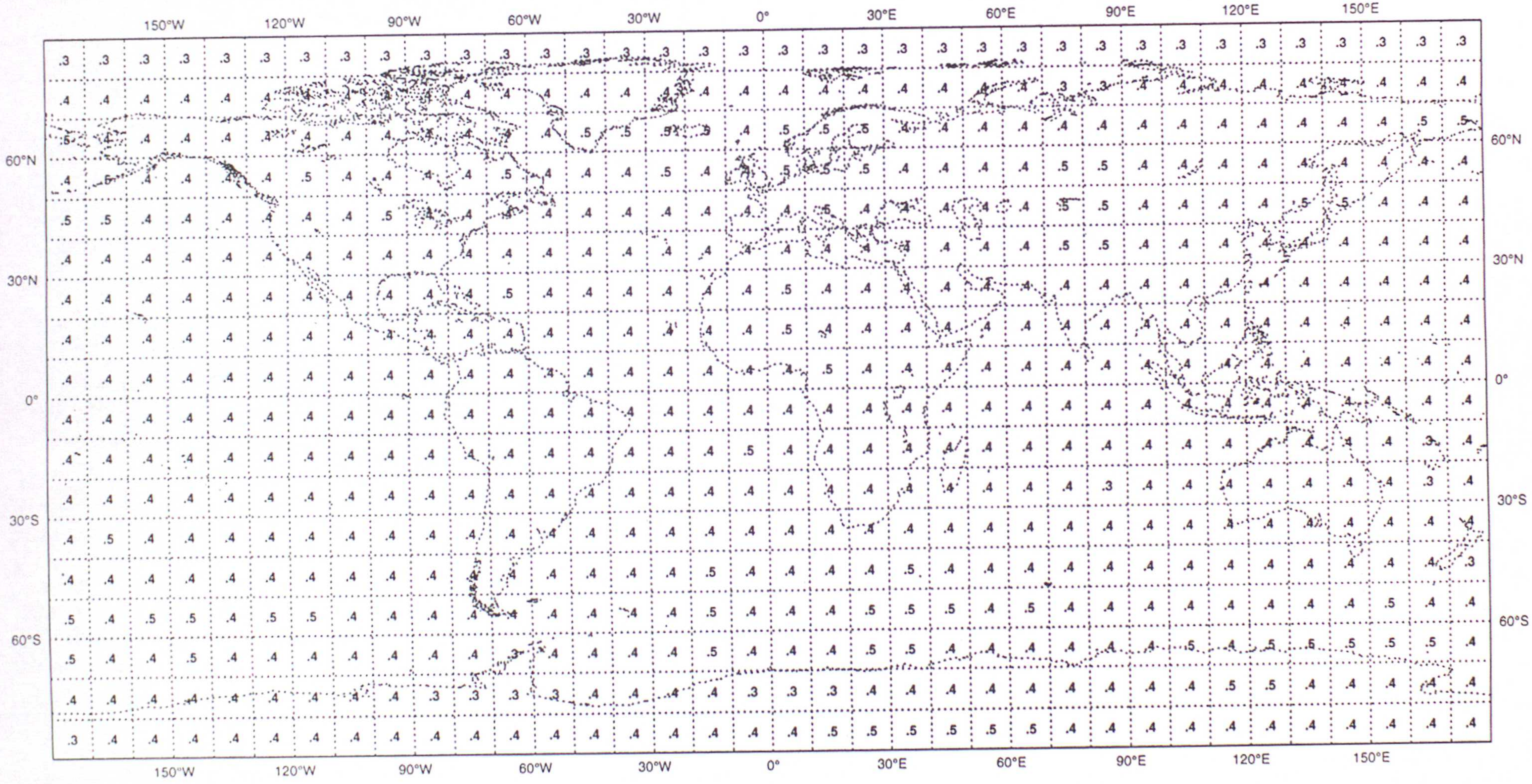

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 68. ATOVS MEAN O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations

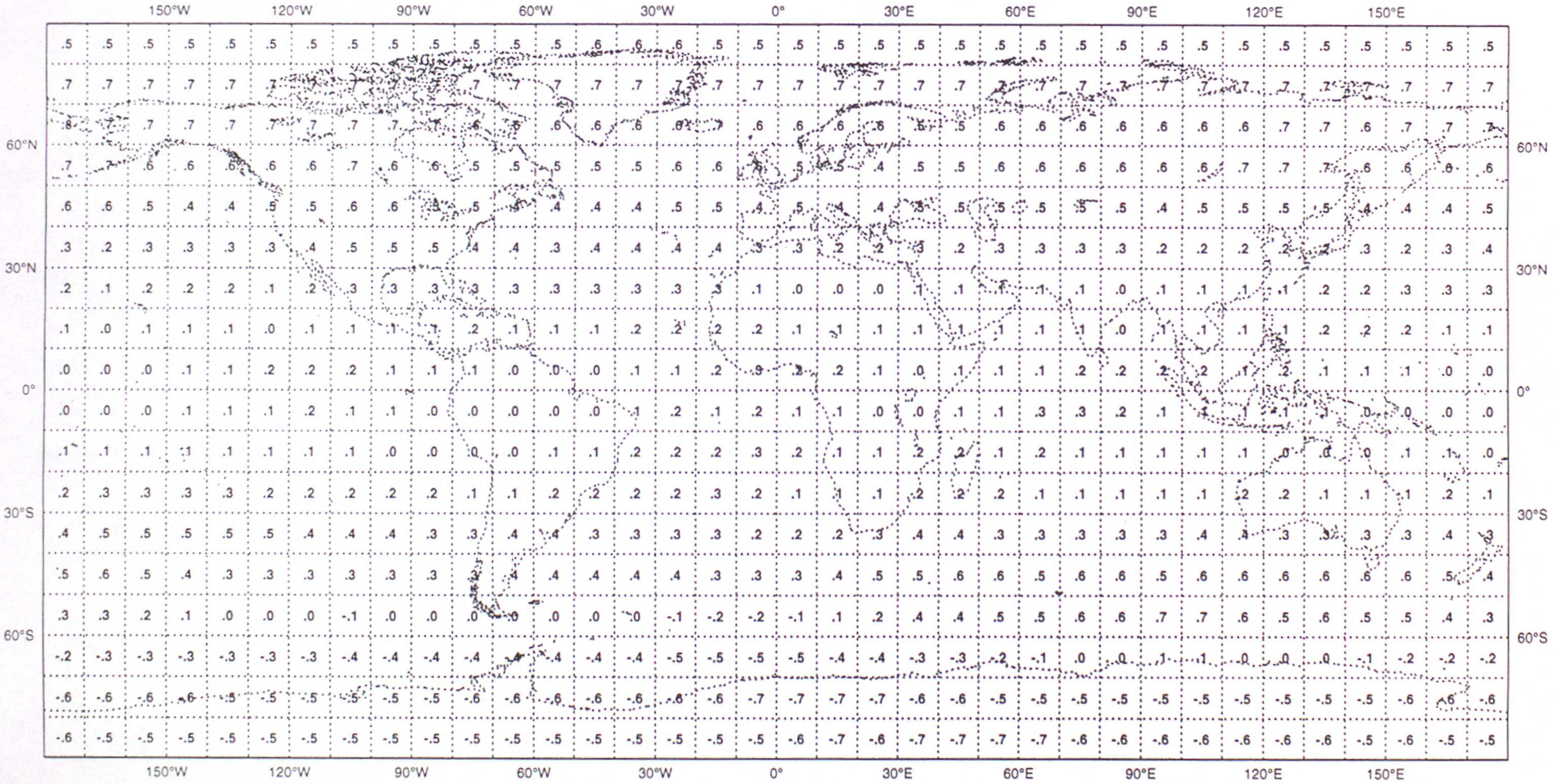

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 69. ATOVS SD O-B brightness temperature differences (deg C). SEPTEMBER 2003
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations

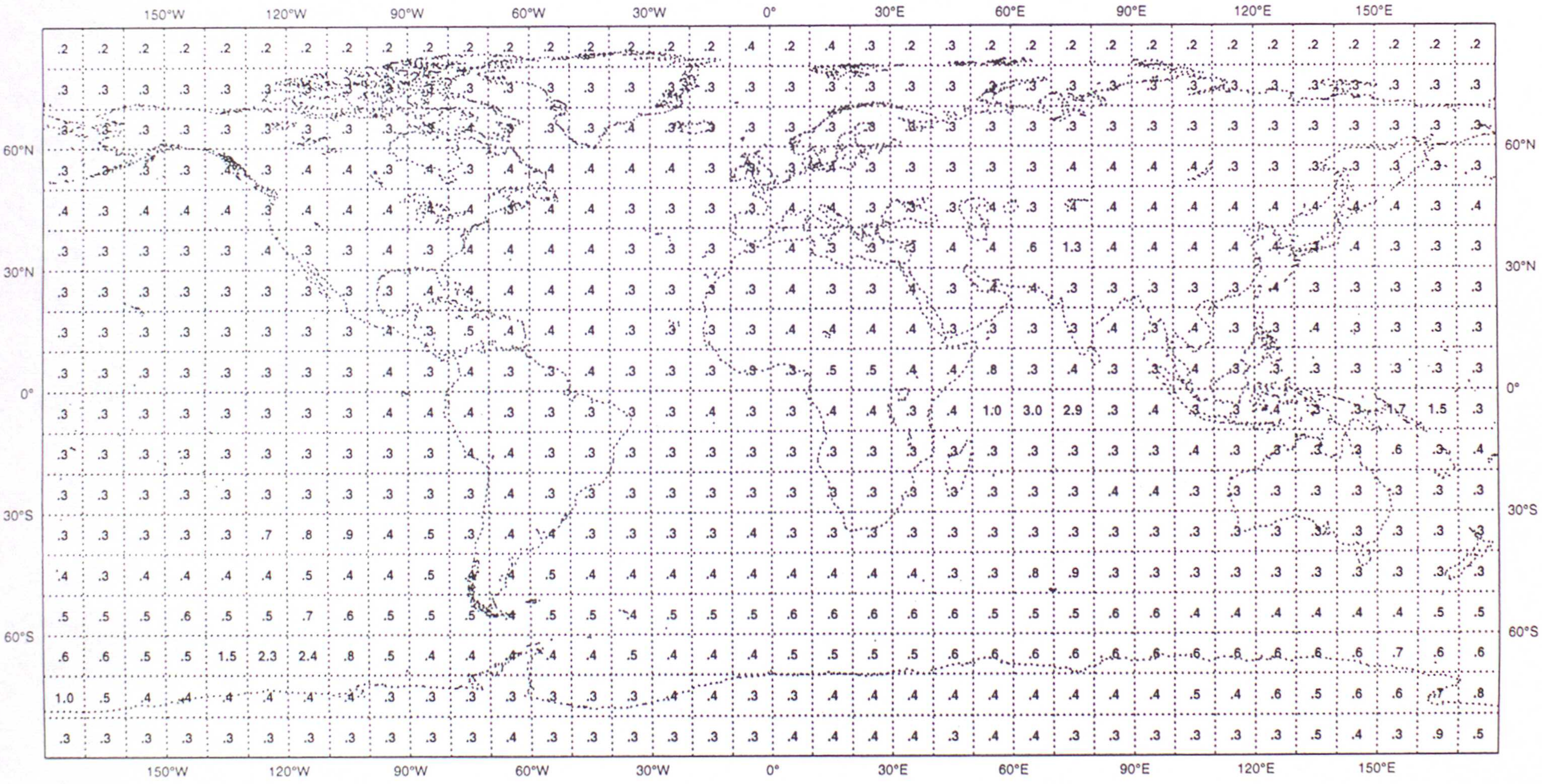

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .4 .2 .4 .3 .2 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .4 .3 .4 .4 .3 .4 .3 .4 .4 .4 .4 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3
.4 .3 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4
.3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .4 .4 .6 1.3 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .5 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .4 .3 .3 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .3 .4 .3 .3 .3 .9 .3 .5 .5 .4 .4 .8 .3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .4 1.0 3.0 2.9 .3 .4 .3 .3 .4 .3 .3 1.7 1.5 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .6 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .7 .8 .9 .4 .5 .3 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .3 .4 .4 .4 .4 .5 .4 .4 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .8 .9 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.5 .5 .5 .6 .5 .5 .7 .6 .5 .5 .5 .4 .5 .5 .4 .5 .5 .5 .6 .6 .6 .6 .6 .5 .5 .5 .6 .6 .4 .4 .4 .4 .4 .4 .5 .5
.6 .6 .5 .5 1.5 2.3 2.4 .8 .5 .4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .6 .6
1.0 .5 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .6 .5 .6 .6 .7 .8
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .5 .4 .3 .9 .5

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures **Period**		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
12520	38.2	-0.6	P	49	0	12	0.5	-0.8	1.0
13599	19.2	-34.6	P	501	5	16	1.7	-0.2	1.8
13600	18.1	-28.6	P	804	0	29	0.6	0.4	0.7
13602	18.1	-32.2	P	564	0	1	0.6	0.1	0.6
41502	14.9	-69.8	P	1511	0	70	0.5	1.2	1.3
41503	24.5	-71.6	P	853	0	58	0.7	-2.8	2.8
41504	11.0	-57.7	P	1485	0	69	0.6	1.0	1.1
41520	10.0	-47.6	P	1492	0	67	0.6	0.6	0.9
41521	15.8	-50.0	P	1507	0	76	1.1	-3.4	3.5
41522	23.1	-58.2	P	648	0	1	1.3	-2.1	2.4
41532	24.1	-72.5	P	651	0	1	0.6	0.9	1.0
41534	26.8	-62.1	P	665	0	0	0.7	0.8	1.0
41537	29.7	-61.1	P	640	0	2	1.6	0.9	1.8
41579	16.2	-60.7	P	163	0	0	0.5	1.0	1.1
41590	15.7	-58.5	P	166	0	0	0.5	1.1	1.2
41630	30.8	-75.7	P	546	0	1	0.6	1.2	1.4
41631	25.9	-74.4	P	536	0	1	0.6	0.7	0.9
41645	26.0	-77.3	P	610	0	1	0.6	1.1	1.2
41646	22.2	-72.2	P	571	0	1	0.5	0.5	0.7
41647	20.7	-72.3	P	626	0	1	0.5	0.8	1.0
41655	25.0	-71.4	P	576	0	1	0.6	1.0	1.2
41659	29.5	-42.4	P	687	0	0	0.6	0.1	0.6
41666	35.3	-51.3	P	696	0	1	0.6	0.6	0.8
41907	27.3	-62.4	P	304	0	3	1.0	0.1	1.0
41910	25.8	-65.3	P	323	0	0	0.5	0.6	0.8
41911	27.4	-65.5	P	344	0	0	0.5	0.4	0.6
41912	25.9	-65.2	P	222	0	0	0.6	0.6	0.9
41913	24.8	-63.6	P	337	0	0	0.7	0.4	0.8
41914	27.0	-62.2	P	333	0	0	0.6	1.1	1.2
41916	25.3	-63.5	P	315	0	0	0.6	1.0	1.1
41917	24.9	-64.5	P	316	0	0	0.6	0.7	0.9
42565	12.6	-75.9	P	66	98	98	0.0	0.6	0.6
42567	10.7	-76.2	P	107	100	100			
44546	52.1	-51.3	P	182	0	1	0.5	0.9	1.0
44551	44.5	-42.8	P	553	0	0	0.7	0.2	0.7
44585	41.5	-69.5	P	477	0	33	0.6	1.3	1.4
44603	57.6	-26.6	P	1118	0	39	0.8	-0.1	0.9
44605	52.5	-39.1	P	926	0	28	0.6	-0.2	0.7
44606	38.2	-58.8	P	688	0	0	0.9	0.0	0.9
44608	35.5	-38.5	P	686	0	0	0.8	0.0	0.8
44609	56.4	-13.6	P	672	0	0	0.5	-0.5	0.7
44611	59.4	-22.0	P	685	0	1	0.9	-0.4	1.0
44613	54.3	-25.6	P	643	0	2	1.3	-0.5	1.4
44614	56.9	-42.7	P	959	0	32	0.6	-0.3	0.7
44615	45.2	-31.1	P	648	0	0	0.6	-0.5	0.8
44620	40.9	-23.4	P	1065	0	39	0.6	-0.2	0.7
44621	60.3	-36.0	P	651	0	0	0.8	0.3	0.9
44622	53.3	-20.3	P	637	0	0	0.5	-0.2	0.6
44623	33.1	-45.8	P	684	0	0	0.6	0.0	0.6
44626	38.6	-72.2	P	682	0	1	0.8	0.6	1.0
44628	37.3	-34.5	P	680	0	0	0.6	-0.5	0.8
44630	38.4	-59.3	P	1097	0	38	0.8	0.5	0.9
44723	40.3	-20.2	P	380	0	0	0.5	-0.4	0.6
44726	62.9	-62.6	P	1503	0	53	0.8	0.0	0.8
44730	58.6	-25.0	P	1422	0	51	1.3	0.5	1.4
44742	48.2	-50.6	P	312	0	0	0.5	0.1	0.5
44743	49.7	-49.2	P	312	0	0	0.5	-0.1	0.5
44744	50.1	-46.1	P	687	0	0	0.5	0.1	0.6
44745	53.4	-44.1	P	335	0	0	0.5	0.0	0.5
44747	53.0	-44.8	P	15	0	0	0.5	0.4	0.6

IDENTIFIER LAT. LONG. ELEM NOBS PGE %REJ SD BIAS RMS

44760	57.2	-38.9	P	12	0	0	0.3	0.6	0.6
44762	55.0	-42.0	P	14	0	0	0.3	0.5	0.6
44764	61.1	-12.1	P	1663	0	60	0.7	-0.4	0.9
44770	51.5	-37.3	P	40	0	22	0.4	-0.2	0.4
44771	47.5	-47.8	P	96	0	31	0.5	0.1	0.5
44774	37.9	-12.0	P	267	0	15	0.5	-0.1	0.5
44776	52.4	-10.8	P	302	0	27	0.6	0.0	0.6
44777	38.4	-19.8	P	296	0	18	0.6	-0.1	0.6
44778	40.5	-26.3	P	397	0	21	0.6	0.0	0.6
44779	54.5	-18.2	P	542	0	36	0.6	-0.1	0.7
44780	56.8	-46.7	P	726	0	44	0.7	0.0	0.7
47555	44.7	-63.5	P	1	100	100			
62513	34.8	-19.1	P	678	0	0	0.6	0.4	0.7
62514	33.8	-25.2	P	662	0	0	0.6	0.2	0.6
62515	20.2	-49.6	P	697	0	0	0.7	0.8	1.0
62517	27.6	-30.0	P	682	0	0	0.6	-0.3	0.7
62519	46.2	-4.4	P	700	0	8	0.9	-0.6	1.0
62551	43.5	-25.7	P	678	0	5	0.7	0.0	0.7
62552	36.2	-19.8	P	671	0	0	0.6	0.4	0.7
62553	36.9	-18.2	P	669	0	0	0.6	0.1	0.6
62554	40.9	-17.6	P	1144	1	43	1.7	0.6	1.8
62598	53.0	-32.8	P	50	0	28	0.4	-0.2	0.4
62600	51.3	-8.1	P	126	0	31	0.4	0.1	0.4
62711	47.2	-46.0	P	638	0	0	0.8	0.1	0.8
62712	54.9	-39.1	P	1204	0	43	0.7	-0.1	0.7
62801	39.1	-20.8	P	726	0	14	0.6	0.5	0.8
62802	36.9	-21.8	P	663	0	0	0.6	-0.4	0.7
62803	45.8	-10.9	P	1079	0	40	1.2	-0.2	1.2
62804	48.1	-8.9	P	663	0	0	0.5	-0.7	0.8
64523	61.1	-29.9	P	672	0	0	1.0	0.0	1.0

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13599	19.2	-34.6	SPEED	401	0	100	1.3	-2.8	3.1
13600	18.1	-28.6	SPEED	795	0	100	1.0	-1.5	1.8
13602	18.1	-32.2	SPEED	554	0	100	1.0	-1.3	1.7
41522	23.1	-58.2	SPEED	649	0	100	2.2	-0.7	2.3
41532	24.1	-72.5	SPEED	8	0	100	0.9	0.2	0.9
41534	26.8	-62.1	SPEED	417	1	100	2.6	-2.2	3.4
41579	16.2	-60.7	SPEED	82	0	100	1.2	-0.3	1.3
41590	15.7	-58.5	SPEED	166	0	100	1.1	-0.9	1.4
41630	30.8	-75.7	SPEED	522	0	100	1.7	-0.6	1.8
41631	25.9	-74.4	SPEED	229	0	100	3.6	2.5	4.4
41645	26.0	-77.3	SPEED	305	0	100	2.5	1.7	3.0
41646	22.2	-72.2	SPEED	556	0	100	1.4	-0.3	1.4
41647	20.7	-72.3	SPEED	587	0	100	1.9	0.3	1.9
41655	25.0	-71.4	SPEED	561	0	100	1.9	0.3	1.9
41907	27.3	-62.4	SPEED	299	4	100	6.8	4.1	7.9
41910	25.8	-65.3	SPEED	317	6	100	7.1	5.3	8.9
41911	27.4	-65.5	SPEED	342	5	100	7.1	3.9	8.1
41912	25.9	-65.2	SPEED	214	6	100	8.0	5.1	9.4
41913	24.8	-63.6	SPEED	330	6	100	7.0	4.7	8.4
41914	27.0	-62.2	SPEED	317	1	100	5.5	-0.2	5.5
41916	25.3	-63.5	SPEED	305	4	100	7.2	4.7	8.6
41917	24.9	-64.5	SPEED	314	7	100	6.7	4.3	8.0
44546	52.1	-51.3	SPEED	181	0	100	2.4	0.4	2.4
44551	44.5	-42.8	SPEED	478	0	100	2.4	1.5	2.9
44615	45.2	-31.1	SPEED	641	1	100	2.4	0.8	2.5
44620	40.9	-23.4	SPEED	1060	0	100	2.1	-0.1	2.1
62711	47.2	-46.0	SPEED	303	4	100	4.0	4.4	5.9

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13599	19.2	-34.6	DIRN.	24	0	0	18.3	-31.4	36.3
13600	18.1	-28.6	DIRN.	478	0	0	11.2	20.4	23.3

13602	18.1	-32.2	DIRN.	384	0	0	14.8	26.6	30.5
41522	23.1	-58.2	DIRN.	315	0	0	16.9	-7.6	18.5
41532	24.1	-72.5	DIRN.	8	0	0	7.3	-49.5	50.1
41534	26.8	-62.1	DIRN.	246	1	0	10.5	8.2	13.3
41579	16.2	-60.7	DIRN.	43	0	0	11.4	12.7	17.1
41590	15.7	-58.5	DIRN.	109	0	0	16.4	-6.9	17.8
41630	30.8	-75.7	DIRN.	218	0	0	25.3	-2.3	25.4
41631	25.9	-74.4	DIRN.	122	0	0	19.7	5.3	20.4
41645	26.0	-77.3	DIRN.	106	0	0	26.0	21.0	33.4
41646	22.2	-72.2	DIRN.	253	0	0	27.2	16.5	31.8
41647	20.7	-72.3	DIRN.	295	0	0	19.5	10.4	22.1
41655	25.0	-71.4	DIRN.	243	0	0	19.9	0.0	19.9
41907	27.3	-62.4	DIRN.	197	6	0	30.9	26.2	40.6
41910	25.8	-65.3	DIRN.	179	11	0	21.4	24.3	32.4
41911	27.4	-65.5	DIRN.	220	8	0	20.4	16.4	26.2
41912	25.9	-65.2	DIRN.	124	10	0	27.1	49.9	56.7
41913	24.8	-63.6	DIRN.	229	9	0	21.8	22.0	31.0
41914	27.0	-62.2	DIRN.	169	1	0	28.6	24.3	37.5
41916	25.3	-63.5	DIRN.	187	6	0	21.0	27.1	34.3
41917	24.9	-64.5	DIRN.	189	12	0	26.3	24.7	36.1
44546	52.1	-51.3	DIRN.	94	0	0	42.4	23.6	48.5
44551	44.5	-42.8	DIRN.	323	0	0	18.2	-17.6	25.3
44615	45.2	-31.1	DIRN.	539	1	0	15.7	7.3	17.3
44620	40.9	-23.4	DIRN.	551	0	0	16.5	-16.0	23.0
62711	47.2	-46.0	DIRN.	235	5	0	16.8	-14.6	22.2

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	647	1	14	2.1	0.3	569	0	14	0	9.4	-0.2
ACA	1557	0	1	1.5	-0.1	1508	0	2	0	7.3	0.4
ADB	21	0	5	2.3	-1.6	22	0	9	0	9.7	-3.5
AEA	206	0	4	1.6	0.3	120	0	7	0	8.1	-0.1
AEL	345	1	10	1.6	-0.1	303	1	13	0	7.7	0.8
AEW	66	0	2	1.4	-0.5	70	0	17	0	14.7	0.2
AFL	483	0	4	1.9	0.6	456	1	4	0	8.2	0.3
AFR	703	1	5	1.5	0.1	648	0	5	0	7.2	0.7
AIS	130	2	12	1.6	-0.7	119	1	11	0	7.5	0.7
AJM	257	0	3	1.4	-0.2	236	0	4	0	8.6	0.7
AMM	86	0	1	1.2	0.5	80	0	6	0	10.3	-0.3
AMT	36	0	19	2.0	0.1	39	0	18	0	8.4	-0.6
AMX	215	1	6	1.5	0.2	178	1	10	0	8.4	0.9
ATN	21	10	100	1.6	-0.1	20	0	10	0	9.2	1.4
AZA	420	6	18	2.5	0.2	401	0	8	0	9.3	0.0
BAL	117	0	4	1.0	0.2	106	0	8	0	8.1	1.0
BAW	546	0	9	1.8	-0.6	540	0	9	0	8.1	0.3
BPA	100	34	45	3.3	1.4	90	1	10	0	9.5	-1.5
BSK	52	0	6	1.8	0.2	54	2	11	0	11.3	0.5
BWA	84	0	7	1.6	0.3	71	0	7	0	6.5	0.2
CFC	30	0	10	1.9	-1.0	29	0	17	0	10.4	-0.3
CFG	340	0	4	1.5	-0.1	313	0	3	0	7.6	0.0
CGB	21	5	10	2.0	-0.6	21	0	0	0	7.2	0.9
CKS	165	14	19	2.0	0.2	174	1	9	0	10.6	0.4
CLX	226	0	1	1.6	-0.4	210	0	2	0	6.8	0.1
COA	83	0	48	1.3	-0.1	73	1	62	0	10.2	0.1
CRL	150	0	2	1.4	0.1	120	0	4	0	8.8	-0.3
CUB	79	1	3	1.3	-0.1	64	0	5	0	10.9	-1.5
DAL	1074	0	5	1.5	-0.5	997	0	6	0	8.6	0.1
DBR	36	0	3	1.9	0.1	38	3	3	0	5.0	1.0
DCE	83	1	7	1.6	-1.0	79	0	8	0	7.0	-0.6
DCS	36	6	22	2.6	-0.2	36	0	22	0	11.1	-0.1
DHL	162	1	100	6.5	-6.4	158	0	100	0	17.6	3.2
DLH	726	1	13	1.7	0.2	727	0	13	0	7.9	0.6
EDW	56	2	4	1.1	-0.2	53	0	2	0	5.2	1.5
EEZ	53	2	23	2.6	0.9	53	0	11	0	5.8	1.1
EIA	243	0	17	2.6	1.7	234	1	100	0	20.3	5.2
ELY	205	0	2	1.3	0.1	202	0	2	0	5.9	0.2
FDX	761	1	28	1.4	0.2	763	0	28	0	7.7	0.8
FIN	255	0	3	1.5	0.1	241	0	3	0	6.4	0.6
GAF	51	0	2	1.4	-0.8	48	0	2	0	8.9	0.2
GCO	222	1	6	1.3	0.2	223	0	74	0	7.8	1.0
GRL	49	0	6	2.8	0.4	46	0	2	0	8.6	0.4
GTI	146	0	8	1.8	0.7	144	0	10	0	8.6	-0.4
HLN	53	0	2	1.8	-0.9	49	0	2	0	7.0	0.8
IBE	994	1	7	1.6	0.3	761	0	9	0	7.2	0.5
ICE	782	0	1	1.4	0.0	759	0	3	0	7.9	0.8
IWD	89	0	2	1.3	0.1	50	0	4	0	4.7	1.4
KLM	938	0	2	1.7	0.1	870	0	1	0	6.6	0.7
LAN	30	0	17	1.5	0.6	30	10	33	0	16.9	-3.2
LDI	265	1	15	2.9	0.8	222	1	6	0	10.2	-0.2
LOT	120	2	8	1.9	-1.1	116	0	8	0	8.1	2.2
LTU	521	2	7	1.8	-0.4	440	0	6	0	7.4	0.9
LXR	21	0	5	2.0	1.2	20	0	5	0	6.6	-0.8
MAS	21	0	0	1.6	0.6	21	0	0	0	5.4	0.5
MON	78	1	3	1.6	0.1	74	0	3	0	7.9	0.2
MPD	104	1	10	2.6	1.1	63	0	2	0	7.9	0.3
MPH	469	0	3	1.9	-0.8	450	0	4	0	7.6	-0.2
MYT	185	1	5	1.8	-0.4	182	0	3	0	6.9	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

NAO	22	0	0	1.4	0.0	22	0	0	0	5.5	-0.8
NCA	38	0	0	1.5	0.3	34	0	0	0	5.3	0.8
NWA	3020	0	3	1.8	0.4	3026	0	3	0	7.3	0.3
OAE	107	2	5	1.4	-0.1	107	1	44	0	18.4	4.3
OOM	135	0	4	1.8	0.8	124	0	5	0	8.3	-0.2
PAC	237	0	8	2.1	0.4	229	1	8	0	9.0	0.1
RAM	194	1	8	2.4	0.9	133	1	78	0	9.0	-0.4
RCH	206	2	21	2.9	0.3	175	0	70	0	9.3	1.3
RRR	144	1	15	2.2	-0.2	145	1	12	0	8.6	0.5
RZO	227	0	4	1.6	-0.4	191	0	4	0	7.3	1.1
SEU	64	0	3	1.7	0.4	65	0	5	0	9.8	0.8
SLR	117	0	8	1.5	0.1	111	0	9	0	8.3	-0.1
SSV	35	0	0	1.4	-0.4	35	0	3	0	6.0	1.0
SVA	35	0	3	1.1	0.1	32	0	0	0	4.9	0.0
TAG	32	0	3	2.3	1.1	33	0	9	0	9.6	-0.3
TAP	186	1	2	1.3	-0.1	111	1	7	0	11.4	-0.2
TSC	185	1	4	1.6	-0.1	177	0	5	0	8.2	0.8
UAL	323	0	62	2.0	-1.1	315	0	63	0	8.9	0.0
UPS	1019	0	49	1.4	0.0	987	0	49	0	7.8	0.5
USA	29	0	7	1.9	0.2	27	0	19	0	14.1	-2.9
VIR	154	1	1	1.3	0.0	156	1	6	0	8.4	0.5
WOA	230	0	8	1.2	0.1	236	0	12	0	10.3	1.1

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	28557	0	18	1.2	0.3	28557	0	18	0	4.6	0.4
KL	174	0	3	1.3	0.9	175	0	3	0	5.8	0.8
TN	23	0	13	2.5	1.3	22	0	14	0	10.2	0.2
N	488	1	4	2.1	0.7	491	0	6	0	8.4	0.8
US ACARS	18485	2	39	1.3	0.3	18485	0	28	0	5.0	0.3

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	100	5	0	13.1	45.3	43.4
DBBH	00	Z	100	20	0	9.6	20.2	17.8
DBBH	12	Z	100	23	0	22.3	33.6	25.2
DBLK	12	Z	100	15	0	17.3	21.1	12.1
EBUQ	12	Z	100	15	0	14.6	14.6	-0.3
ELML7	00	Z	100	13	0	12.6	13.2	3.8
ELML7	12	Z	100	11	0	8.0	8.5	-2.7
FQFL	00	Z	100	6	0	14.1	30.9	-27.5
FQFL	12	Z	100	7	0	11.8	18.5	-14.3
FQFM	00	Z	100	2	0	12.5	12.5	-0.5
FQFM	12	Z	100	4	0	6.7	6.8	-1.3
KHRH	00	Z	100	5	1	40.1	42.1	12.8
KHRH	12	Z	100	5	0	17.9	33.4	28.2
KRPD	00	Z	100	8	0	14.4	14.4	0.8
KRPD	12	Z	100	11	1	13.9	20.5	15.1
LDWR	00	Z	100	24	0	10.6	10.7	-1.6
LDWR	12	Z	100	25	0	11.4	13.5	-7.3
OXVH2	00	Z	100	5	0	4.4	21.8	21.4
OXVH2	12	Z	100	4	0	10.1	11.3	5.3
OXYH2	00	Z	100	5	0	35.7	36.8	9.0
OXYH2	12	Z	100	3	0	28.3	28.3	1.0
V2XM	00	Z	100	1	0	0.0	23.0	23.0
WPKD	00	Z	100	7	1	6.7	7.6	-3.6
WPKD	12	Z	100	7	0	9.6	10.1	3.1
ZCBP6	00	Z	100	4	0	1.9	52.0	52.0
ZCBP6	12	Z	100	7	1	9.4	46.3	45.3
03953	00	Z	100	29	0	12.3	18.2	13.4
03953	12	Z	100	29	0	13.1	19.2	14.0
04018	00	Z	100	29	0	11.7	21.6	18.1
04018	12	Z	100	30	0	15.2	18.4	10.4
04220	00	Z	100	25	0	15.2	15.2	-1.1
04220	12	Z	100	30	0	11.0	11.5	3.2
04270	00	Z	100	23	0	11.5	19.8	16.0
04270	12	Z	100	27	0	9.0	20.7	18.6
04339	00	Z	100	26	0	11.3	13.5	7.3
04339	12	Z	100	30	0	10.5	10.9	3.0
04360	00	Z	100	26	0	13.2	21.9	17.4
04360	12	Z	100	28	0	16.3	23.8	17.3
08001	00	Z	100	20	2	27.3	30.6	-13.8
08001	12	Z	100	22	0	26.2	27.2	-7.0
08508	00	Z	100	20	0	10.6	11.3	3.7
08508	12	Z	100	29	0	10.0	12.1	6.9
08522	12	Z	100	28	0	8.6	18.0	15.8
08594	12	Z	100	22	0	16.8	22.5	15.0
71600	00	Z	100	28	0	10.5	12.8	7.3
71600	12	Z	100	30	0	11.2	13.7	7.9
72201	00	Z	100	29	0	10.6	19.8	16.7
72201	12	Z	100	30	0	8.9	33.4	32.2
72402	00	Z	100	28	0	33.8	35.8	11.9
72402	12	Z	100	29	0	12.3	45.3	43.6
74494	00	Z	100	23	0	13.7	14.8	5.6
74494	12	Z	100	27	0	8.5	8.6	-1.3
78016	00	Z	100	26	0	11.5	18.8	14.8
78016	12	Z	100	30	0	20.2	37.8	31.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	500	5	0	14.6	17.8	10.2
DBBH	00	Z	500	20	0	8.1	9.7	5.3
DBBH	12	Z	500	24	0	10.3	10.9	-3.6
DBLK	12	Z	500	16	0	9.7	12.6	8.1
EBUQ	12	Z	500	15	0	7.6	13.9	-11.6
ELML7	00	Z	500	13	0	3.5	16.3	-15.9
ELML7	12	Z	500	12	0	5.4	16.8	-15.9
FQFL	00	Z	500	8	0	6.4	10.3	-8.0
FQFL	12	Z	500	7	0	6.9	9.2	-6.0
FQFM	00	Z	500	2	0	4.0	5.7	-4.0
FQFM	12	Z	500	5	0	5.6	11.1	-9.6
KHRH	00	Z	500	5	1	39.4	39.7	-4.2
KHRH	12	Z	500	5	0	9.4	13.3	9.4
KRPD	00	Z	500	8	0	8.9	9.0	1.0
KRPD	12	Z	500	11	1	10.8	12.7	6.7
LDWR	00	Z	500	24	0	9.1	9.3	1.8
LDWR	12	Z	500	25	0	7.5	8.0	-2.9
OXVH2	00	Z	500	6	0	6.7	7.5	3.5
OXVH2	12	Z	500	5	0	8.9	10.5	5.6
OXYH2	00	Z	500	5	0	16.1	18.3	8.6
OXYH2	12	Z	500	3	0	7.3	12.1	9.7
V2XM	00	Z	500	1	0	0.0	2.0	2.0
V2XM	12	Z	500	1	0	0.0	12.0	12.0
WPKD	00	Z	500	8	1	6.2	8.8	-6.3
WPKD	12	Z	500	7	0	10.1	10.8	-4.0
ZCBP6	00	Z	500	5	0	10.6	31.1	29.2
ZCBP6	12	Z	500	8	0	8.5	33.5	32.4
03953	00	Z	500	29	0	8.6	8.8	1.8
03953	12	Z	500	29	0	5.5	5.7	1.3
04018	00	Z	500	29	0	10.8	13.0	7.2
04018	12	Z	500	30	0	12.5	13.7	5.5
04220	00	Z	500	25	0	9.2	10.5	5.0
04220	12	Z	500	30	0	7.8	10.5	7.0
04270	00	Z	500	27	0	7.9	11.6	8.5
04270	12	Z	500	30	0	7.8	13.5	11.0
04339	00	Z	500	26	0	7.5	11.8	9.2
04339	12	Z	500	30	0	10.8	12.0	5.2
04360	00	Z	500	26	0	9.0	11.2	6.8
04360	12	Z	500	28	0	9.7	13.3	9.1
08001	00	Z	500	25	2	15.4	17.6	-8.5
08001	12	Z	500	28	0	13.7	14.5	-4.8
08508	00	Z	500	20	0	7.4	11.2	-8.3
08508	12	Z	500	29	0	11.2	12.7	-6.0
08522	12	Z	500	29	0	7.2	7.4	1.8
08594	12	Z	500	26	0	6.7	7.9	-4.2
71600	00	Z	500	28	0	8.8	9.0	-1.9
71600	12	Z	500	30	0	12.1	12.3	2.3
72201	00	Z	500	29	0	4.7	4.7	-0.3
72201	12	Z	500	30	0	7.0	8.1	4.1
72402	00	Z	500	29	0	13.8	14.1	-2.8
72402	12	Z	500	29	0	5.6	6.3	3.0
74494	00	Z	500	25	0	13.3	14.2	-5.1
74494	12	Z	500	28	0	7.4	7.5	-1.1
78016	00	Z	500	27	0	7.7	9.9	6.3
78016	12	Z	500	30	0	14.8	20.6	14.2

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	100	5	0	0	1.9	-0.7	-0.3
DBBH	00	V	100	20	0	0	3.2	0.5	0.0
DBBH	12	V	100	23	0	0	3.4	0.3	1.2
DBLK	12	V	100	16	0	0	3.3	1.0	1.2
EBUQ	12	V	100	15	0	6	8.1	0.6	0.8
ELML7	00	V	100	12	0	0	2.7	-0.1	-0.5
ELML7	12	V	100	11	0	0	4.1	-1.2	-1.0
FQFL	00	V	100	6	0	0	4.9	1.7	2.0
FQFL	12	V	100	8	0	0	4.8	-0.3	0.3
FQFM	00	V	100	2	0	0	1.6	0.9	-0.2
FQFM	12	V	100	4	0	0	2.8	-0.2	0.2
KHRH	00	V	100	5	0	0	4.6	0.8	1.1
KHRH	12	V	100	2	0	0	2.7	1.6	-1.2
KRPD	00	V	100	7	0	0	5.8	-2.7	1.1
KRPD	12	V	100	9	0	11	10.1	-2.9	-1.2
LDWR	00	V	100	24	0	0	2.9	0.1	-0.4
LDWR	12	V	100	25	0	0	2.6	0.6	-0.5
OXVH2	00	V	100	3	0	0	2.8	-1.1	-1.6
OXVH2	12	V	100	4	0	25	11.6	-2.2	4.6
OXYH2	00	V	100	4	0	25	13.3	1.6	-5.9
OXYH2	12	V	100	3	0	0	4.8	-3.6	-0.3
V2XM	00	V	100	1	0	0	2.7	1.4	-2.3
WPKD	00	V	100	6	0	0	5.3	-0.5	1.9
WPKD	12	V	100	6	0	0	1.7	-0.7	-0.6
ZCBP6	00	V	100	4	0	0	2.8	0.3	1.4
ZCBP6	12	V	100	7	0	14	9.5	-1.4	-3.8
03953	00	V	100	29	0	0	3.2	0.4	0.1
03953	12	V	100	29	0	0	3.0	1.2	0.3
04018	00	V	100	27	0	0	3.4	0.0	0.9
04018	12	V	100	30	0	0	3.3	-0.1	0.2
04220	00	V	100	25	0	0	2.6	-0.4	0.1
04220	12	V	100	30	0	0	2.9	0.2	-0.3
04270	00	V	100	22	0	0	4.7	-1.9	0.0
04270	12	V	100	27	0	3	7.1	-2.2	-0.5
04339	00	V	100	15	0	0	8.0	2.8	-0.7
04339	12	V	100	25	0	0	5.1	-1.3	0.3
04360	00	V	100	26	0	0	3.4	-0.7	0.4
04360	12	V	100	27	0	0	3.2	-0.4	-0.4
08001	00	V	100	20	0	0	5.1	1.7	1.2
08001	12	V	100	18	0	0	5.9	-1.7	-0.1
08508	00	V	100	8	0	0	5.2	0.3	1.8
08508	12	V	100	18	0	0	3.9	0.3	0.0
08522	12	V	100	27	0	0	5.0	0.1	0.1
08594	12	V	100	22	0	100	3.8	-0.4	0.4
71600	00	V	100	28	0	0	3.4	-0.5	0.6
71600	12	V	100	30	0	0	3.4	0.3	-0.3
72201	00	V	100	29	0	0	3.3	0.6	0.4
72201	12	V	100	30	0	0	3.4	0.5	0.1
72402	00	V	100	28	0	0	3.4	0.4	-0.1
72402	12	V	100	29	0	0	4.8	0.2	-1.3
74494	00	V	100	23	0	82	3.1	-1.3	0.1
74494	12	V	100	27	0	74	2.8	-0.2	0.5
78016	00	V	100	26	0	0	4.1	0.9	-1.1
78016	12	V	100	30	0	0	5.1	-1.6	0.8

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: Sep 03

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DASAP3	12	V	500	5	0	0	2.7	0.4	0.1
DBBH	00	V	500	18	0	0	3.8	-0.4	0.4
DBBH	12	V	500	24	0	0	4.4	0.3	1.3
DBLK	12	V	500	16	0	0	4.2	0.0	0.1
EBUQ	12	V	500	15	0	6	6.3	0.2	-0.1
ELML7	00	V	500	12	0	0	4.5	-1.6	0.1
ELML7	12	V	500	8	0	0	3.7	-1.3	-0.7
FQFL	00	V	500	8	0	0	5.2	-0.3	-1.8
FQFL	12	V	500	8	0	0	3.7	-0.4	0.2
FQFM	00	V	500	2	0	0	3.8	-0.7	2.8
FQFM	12	V	500	5	0	0	6.0	1.4	0.3
KHRH	00	V	500	5	0	0	3.9	-1.2	-1.1
KHRH	12	V	500	1	0	0	4.8	2.4	4.1
KRPD	00	V	500	6	0	0	7.3	-1.5	0.3
KRPD	12	V	500	9	1	11	11.3	-5.4	-2.2
LDWR	00	V	500	24	0	0	4.1	0.2	-0.7
LDWR	12	V	500	25	0	0	4.4	0.1	0.1
OXVH2	00	V	500	6	0	16	14.2	-0.4	7.5
OXVH2	12	V	500	5	0	20	12.3	-0.6	5.5
OXYH2	00	V	500	3	0	33	30.0	-0.1	-20.0
OXYH2	12	V	500	3	0	0	2.7	-1.8	0.7
V2XM	00	V	500	1	0	0	2.0	-1.7	-1.0
V2XM	12	V	500	1	0	0	2.9	2.0	2.1
WPKD	00	V	500	6	0	0	4.8	0.4	-0.7
WPKD	12	V	500	6	0	0	2.9	1.7	-1.1
ZCBP6	00	V	500	3	0	0	4.1	2.0	0.9
ZCBP6	12	V	500	7	0	0	3.5	-0.5	-0.8
03953	00	V	500	29	0	0	3.6	0.2	-0.1
03953	12	V	500	29	0	3	5.0	0.8	1.1
04018	00	V	500	29	0	0	4.0	-0.2	-0.6
04018	12	V	500	30	0	0	4.2	-0.5	0.1
04220	00	V	500	24	0	0	4.3	-1.6	-0.1
04220	12	V	500	30	0	0	3.5	0.2	-0.3
04270	00	V	500	27	0	0	4.4	-1.0	-0.3
04270	12	V	500	30	0	0	4.3	-0.5	-0.2
04339	00	V	500	20	0	0	7.1	1.7	0.0
04339	12	V	500	30	0	0	6.2	-0.2	-0.3
04360	00	V	500	26	0	0	4.8	0.0	0.2
04360	12	V	500	28	0	0	3.5	0.4	-0.4
08001	00	V	500	27	0	0	2.8	0.0	-0.8
08001	12	V	500	26	0	3	7.8	-2.3	0.3
08508	00	V	500	8	0	0	4.3	0.9	1.4
08508	12	V	500	18	0	5	5.4	1.0	0.0
08522	12	V	500	29	0	0	3.8	-0.3	0.1
08594	12	V	500	27	0	100	4.4	0.9	-1.9
71600	00	V	500	28	0	0	3.4	0.3	0.2
71600	12	V	500	30	0	3	5.4	0.3	-0.1
72201	00	V	500	29	0	0	2.3	0.2	0.2
72201	12	V	500	30	0	0	3.1	0.4	-1.6
72402	00	V	500	28	0	0	3.5	0.0	-1.1
72402	12	V	500	29	0	0	3.1	0.4	0.6
74494	00	V	500	24	0	79	3.2	-0.5	-0.7
74494	12	V	500	28	0	75	3.4	0.1	0.6
78016	00	V	500	27	0	0	3.4	0.0	-1.5
78016	12	V	500	29	0	0	3.7	-0.5	-0.2

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45